SAILING DIRECTIONS

FOR THE

COAST OF NORTH AMERICA,

BETWEEN

Cape Canso in Nova Scotia and New York.

COMPILED PRINCIPALLY FROM THE SURVEYS MADE BY ORDER OF THE BRITISH AND UNITED STATES GOVERNMENTS.

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SAILING DIRECTIONS

FOR

THE COAST OF NORTH AMERICA,

FROM CAPE CANSO TO NEW YORK HARBOUR.

*** THE BEARINGS AND COURSES ARE ALL BY COMPASS, UNLESS EXPRESSED TO THE CONTRARY. THE SOUNDINGS ARE ALL REDUCED TO THE LEVEL OF LOW WATER, SPRING-TIDES; AND THE DISTANCES ARE IN NAUTICAL MILES OF SIXTY TO EACH DEGREE.

CAPE CANSO TO CAPES SABLE AND ST. MARY.

CAPE CANSO OR CANSEAU.—Off the eastern extremity of Nova Scotia there are a number of islands and dangerous rocks, among which no ship should venture without an intimate knowledge of the locality. Cape Canso is, properly speaking, the eastern point of the largest of these islands, St. Andrew's. Between this island and the main shore there is a narrow passage of 9 to 13 fathoms water, but as there are many rocks scattered about, it is only fit for small vessels, and these must be navigated with considerable care. From St. Andrew's Island to Tor Bay, a distance of 18 miles, the coast is extremely irregular, presenting to view several white cliffy points; it is also bordered with small islands, and here at times the sea breaks in a most furious manner. Hence, following the coast westward to Liscomb Harbour, the shore is composed of red earth and forms several beaches; and from Liscomb Harbour to the Rugged Islands, (excepting the White Isles, which are white rocks,) the capes and outer Islands are bound with black slatey rocks, generally stretching out in spits from east to west. From the Rugged Islands to Devil's Island, at the entrance to Halifax Harbour, there are several remarkably steep red cliffs, between which are beaches.

Cranberry Island.—On the northern part of Cranberry Island there is a lighthouse 60 feet high, which exhibits two fixed lights at 75 and 40 feet above the sea, visible 15 and 10 miles. The building is of wood, octagon-shaped and striped red and white horizontally, and the lights are 35 feet apart.

Of the many rocks in the vicinity of Cape Canso, the breaker, named the Bass, a rock of 3 feet water, lies more than 2 miles in an E. $\frac{1}{2}$ S. to E. by N. $\frac{1}{2}$ N. direction from the lighthouse on Cranberry Island; at seven-tenths of a mile, S.E., from Cape Canso is a similar rock, named the Roaring Bull; and at 1 mile to the E.S.E. of the latter, there is said to be another, but its existence is doubtful.

CANSO HARBOUR, within St. George's Island, is well sheltered, with good ground, and sufficient depth for vessels of any burthen. In a rough sea the dangers show themselves; but with smooth water it is hazardous to enter the passages without a pilot, or a leading wind.

Sailing from the westward into this harbour, so soon as you have passed the Roaring Bull, over which the sea generally breaks, run for Pitipas, or Red Head, taking care, when above the Black Rocks, to keep them open of the rocky islets off Cape Canso, until you bring Glasgow Head and the north end of Inner Island in one, which will carry you above Man-of-War Rock; then steer westerly, being careful to avoid

Mackerel Rock, and make for Burying Island, the north end of which you must not approach nearer than to have a depth of 5 fathoms; then anchor to the north-westward of it, on a bottom of mud.

Coming from the eastward, pass between Cape Canso and Cranberry Island, giving the latter a sufficient berth, to avoid a shoal which stretches to the southward of it, and steer for Pitipas Head, as before directed.

The Northern Passage between Durrell's and George's Islands, notwithstanding its narrowness, yet having a depth of water and a clear channel, will be found to be the best passage into Canso Harbour. In sailing in, keep mid-channel between Bald and Nett Rocks, the former being above water, and the latter drying at one-quarter ebb; when you may steer with safety, by attending to the chart, and the situation of Burying Island. At Canso Harbour it is high water, F. and C., at 7h. 48m.; the tide ranges from 4½ to 6½ feet.

DOVER BAY.—At about 7 miles to the south-westward of Cranberry Island is Dover Bay, a deep inlet lying between Little and Big Dover Islands, Little Dover Island being on the eastern side. At the head of the bay there are many sunken rocks, but in other parts there are 10 to 14 fathoms, with the exception of a rock of about 4 feet lying in the entrance at a mile from White Point, the south point of Little Dover Island. From White Point a dangerous ledge extends out a mile to the southward, many of the rocks forming which are visible in bad weather; these require a good berth to be given them because they are steep-to. The anchorage is on the western side of the bay at about a mile above Big Dover Island, and anchorage may also be obtained between the small islands north-westward of Little Dover Island and the eastern shore. The anchorage within Little Dover Passage is also perfectly secure in any weather.

Little Dover Passage is the narrow intricate channel separating the north point of Little Dover Island from the shore. It has in it a depth of 2 to 9 fathoms, and is only fit for small vessels.

BIG DOVER HARBOUR.—This is a small harbour on the western side of Big Dover Island, in which there is a depth of 5 to 10 fathoms water. Care is requisite when running in, as there are rocks on either side of the entrance. When inside, the anchorage is in 7 fathoms under a small island at the head of the bay.

The channel between Big Dover Island and the shore is narrow, but it affords the advantages of a dock, as vessels can lash to both sides and still be in 30 feet water; when half-way through, however, there are not more than 10 feet water.

WHITE HAVEN lies 4½ miles to the westward of Big Dover Harbour, and is an inlet running into the land a distance of about 3½ miles, which is still further prolonged by the Pleasant River, a broad and deep stream falling into the head of the bay. At its entrance are several islets and sunken ledges, so that caution is necessary when running in, and the assistance of local knowledge would appear to be requisite. Of the rocky islets, the larger and outer one, named White Head, from the colour of its sides, is 70 feet high; this islet appears round and smooth, and is a useful mark, as the passage in, on either side, is in mid-channel. Off the head are two breakers, one in a S.S.E. and the other in an E. by S. direction, but the distance is not stated; there is also a patch of 4 feet lying half a mile S.S.W. ¼ W. from White Head.*

The depth when inside White Haven averages 9 to 12 fathoms, and there is a small island in the middle, about half way up. This island bears the name of Fisherman's Island; it is surrounded by a sunken ledge, particularly on the western side; so that the safest passage would appear to be eastward of it. White Haven has a very irregular shape, and no doubt anchorage may be found in many parts of it. The coast is very barren and has a desolate appearance, particularly about the entrance.

TOR BAY.—The entrance of this bay is formed on the west side by a bold headland, named Berry Head. The channel in is between this head and the islets to the eastward. E.S.E. from the head, and south of George's Island, are three very dangerous rocks, which do not break when the sea is smooth. Within the bay, under the peninsula, there is anchorage, in from 6 to 4 fathoms, muddy bottom, up to the

* On the south-west extremity of *White Head Island* there is a lighthouse 35 feet high, which shows a light flashing every 10″ at 55 feet above the sea, visible 11 miles. The building is pyramidal in form, and coloured white. The light is not totally obscured during the eclipses. It was intended to place a large gun on the island, to be fired every half hour in foggy weather; we are uncertain whether this intention has been carried out.

eastern part of the bay. There is also anchorage on the western side of the bay, in from 7 to 3 fathoms, similar ground, where a vessel may ride in safety during any gale.

In entering, the principal dangers to be avoided are the small sunken rocks in the offing, which do not break in smooth water: they should be left to the eastward. The anchorage is excellent within the bay, on a muddy bottom, excepting a few spots of rocks, sheltered from every wind.

From Tor Bay, westward, to Country Harbour, the land in general continues rocky and barren, with deep water, close in, but regular soundings without of 20 to 30 fathoms.

At 4½ miles from Berry Head there is an inlet of 3 and 4 fathoms, named *New Harbour*, but it is so much exposed that even small vessels, which occasionally resort to it in the fishing season, are under the necessity of leaving the moment a southerly wind arises. At 1½ mile south from its western point, there is a reef of rocks, with deep water close to it.

Coddle's Harbour, 3 miles westward of New Harbour, is formed by a small, rocky island, of the same name. The entrance is on the eastern side of this island, and great care is necessary to avoid the breakers, which in bad weather are generally visible. This place is only suitable for small vessels, and these should be navigated by the coasters.

COUNTRY, ISAAC, AND FISHERMAN'S HARBOURS.—These are three inlets lying 12 to 15 miles to the westward of Berry Head. At the entrance are Green, Goose, and Harbour Islands, the two former of which are connected by a rocky ledge. There are also some dangerous ledges to the southward of these islands, and others exist between them and the western shore, so that the approach to the inlets is by no means unaccompanied with danger. Two rocks, named Castor and Pollux, also lie off the western shore, and are readily perceived when approaching from the south-westward, as they are 10 to 12 feet high, and are situated about 2 miles from the shore, and about the same distance from each other.

Country Harbour, the largest of the inlets, is navigable for large vessels 12 miles from the entrance. In entering, the utmost caution is necessary when steering between the ledges and rocks which are scattered about; but as they fortunately usually show themselves whenever there happens to be a heavy sea, the entrance is rendered comparatively easy. Having passed the Black Ledge, which is the innermost danger, the navigation will be perfectly safe for the largest fleet. The tide is scarcely perceptible, except when, in spring, the ice and snow dissolve, and heavy rains are prevalent.

The approach to Country Harbour should be made if possible with the assistance of a pilot. In approaching from the westward, and having passed Castor and Pollux, give Cape Mocodome a good berth, as a rock named the Bull lies off it, and has 5 to 7 fathoms close to it; this rock lies half a mile from the extremity of the cape, and dries at low water. The Black Ledge above this cape is partly dry at low water, and must also have a good berth given to it, as the water immediately off it is deep.

Between Goose and Harbour Islands there is a depth of 10 to 12 fathoms, and between Harbour Island and the shore are 6 to 8 fathoms. The latter passage is narrow, but there is here excellent anchorage on a muddy bottom, which is a convenient road for going to sea during almost any wind.

Isaac Harbour, on the north side of the entrance to Country Harbour, is about 3 miles long, and has a depth of 6 to 7 fathoms water. The ground is good for holding, so that the small coasting vessels frequently run into it.

Fisherman's Harbour lies south of Country Harbour, immediately behind the Black Ledge. It is about 2½ miles in extent, and has a depth of 10 to 6 and 3 fathoms, the latter being at the head of the bay, where is the anchorage. In entering from the westward, great care is required to avoid the Bull Rock, upon which the sea breaks in bad weather.

Bickerton Harbour, a little to the west of Fisherman's Harbour, is fit for small vessels only; but it is a safe, convenient, and snug little harbour of 5 to 3 fathoms water. At 2 miles to the west of it is *Hollin's Harbour*, a place of shelter for coasters, and resorted to by the fishermen. *Indian Harbour* is a shallow and unsafe creek, but has good lands, well clothed with pine, maple, birch, and spruce. The next inlet, named *Wine Harbour*, has a bar of sand, which is nearly dry.

ST. MARY'S RIVER.—This river is difficult of access, as it is barred by shoal ground, which extends across the stream, at the distance of 1¾ mile above Gunning Point, the West point of the entrance; the assistance of a pilot will therefore be necessary when attempting to run in. Below the bar, towards the western side, is a middle ground, which appears uncovered in very low tides; and above the bar, nearly in mid-channel, is a small, rocky islet. The passage over the bar is on the eastern side of this islet. The tide, which is very rapid, indicates the channel; the latter is devious, between mud-banks, dry at low water, which extend from each shore. The depths upward are from 24 to 18 feet. Sailing in, you should proceed for 4 miles N.N.W., then 2 miles N. by W.; and afterwards N.N.W. to the Fork, where it divides, the western branch terminating in a brook; the eastern branch continuing navigable a quarter of a mile farther up the rapids. The town of Sherbrook is, at present, a small village at the head of the river, about three leagues from the sea.

The islet, named Wedge Isle, which lies at the distance of half a league south from the S.W. point of St. Mary's River, is remarkable, and serves as an excellent guide to the harbours in the vicinity. A beacon, erected upon it, may be seen from 6 to 8 miles off; this beacon is of wood, 140 feet high, covered at the top, and painted white. The side of the islet, towards the mainland, is abrupt, and its summit is 115 feet above the sea. From its S.W. end ledges stretch outward to the distance of half a mile; and some sunken rocks, extending towards it from the main, obstruct the passage nearly half-way over. About 2 miles south from the Wedge is a fishing-bank, of 30 to 20 feet, the area of which is about 200 acres.

THE HARBOUR OF JEGOGAN, on the west side of St. Mary's River, may be readily found by Wedge Isle, situate at the entrance, and by the bold, high land named Redman's Head, on its western side. The passage in is at the distance of a quarter of a mile from that head; because, at the distance of three-quarters of a mile from it, there is a dry ledge, named the Shag. Within the small island on the east side of the entrance named Tobacco Isle, there is anchorage in 4 or 5 fathoms, muddy bottom.

LISCOMB HARBOUR.—The entrance of this harbour, which is one of the best on the coast, is between Liscomb Island and the headland on the west, named Smith or White Point; a mile to the northward of this is Green Point, which is bold-to. From the S.E. end of Liscomb Island, a ledge, with breakers, extends to the distance of three-quarters of a mile. Within, and under the lee of the island, is safe anchorage in from 13 to 8 fathoms. Near the N.E. end of the island, a vessel caught in a S.E. gale may be sheltered by Redman's Head, already described, the anchorage being with the head S.S.E., in 6 and 7 fathoms, on a bottom of clay.

On the west side of the harbour, the ground, from Smith Point, is shoal to the distance of nearly a mile in a S.S.E. direction; and at 2 miles south from the point is a rock, with only 13 feet over it, which lies with Smith and Green Points in one. Another shoal of 12 feet, on which the sea breaks, lies 1¾ mile S.S.W., from the east end of Liscomb Island; a mile within, or nearer this island, in the same direction, there is also a rock. The Black Prince Rock, drying at low water, and on which the sea always breaks, lies S.E. by E. from the east end of Liscomb Island.

To enter the harbour from the southward, between the 12 and 13-feet shoals, which are 1¼ mile apart, keep Green Point well open of Smith's Point, bearing N. by W. ¼ W.; when within a mile of Smith's Point, keep more to the northward, and run up in mid-channel. The island side is bold. The first direction of the harbour is nearly North, then W.N.W. Opposite to the first fish-stage, at half a mile from shore, is as good a berth as can be desired, in 7 fathoms. From this place the harbour is navigable to the distance of 4 miles: it is, however, to be observed, that there are two sunken rocks on the north side.

The coast between Liscomb and Beaver Harbours, an extent of 6 leagues, is denominated the Bay of Islands. Within this space the islets, rocks, and ledges, are so numerous that it would be useless to give a description of them: they form passages in all directions, which have in general a good depth of water. Near Liscomb, at the eastern part of this labyrinth, is an excellent harbour, named Marie-et-Joseph, which is capable of containing a fleet of the largest ships, but requires caution to enter.

The White Islands, nearly half way between the harbours of Beaver and Liscomb, appear of a light stone-colour, with green summits, and are about 60 feet above the level of the sea. The isles are bold on the south side, and there is a safe passage between them; good anchorage also exists within them, in from 10 to 7 fathoms. From these

islands many rocks and ledges extend 5 or 6 miles from E. to E.N.E., which are bold-to, and mostly dry, the water within them being always smooth.

BEAVER HARBOUR.—The Pumpkin and Beaver Islands are very remarkable to vessels sailing along the coast, particularly Pumpkin Island, which is a lofty and dark barren rock. Inside of them there is smooth and excellent shelter during a southerly gale. Sutherland Island, north of them, has, on its N.W. side, a small but deep and bold inlet, where a vessel may lie concealed, and as secure as in a dock. When in the offing, Beaver Harbour is remarkable on account of the small island which lies north of the black rock, having at its southern end a red cliff, being the only one on this part of the coast: having entered the harbour, you may choose your anchorage, according to the direction of the wind, the bottom being generally mud. The basin on the west side is so steep-to, that a small vessel may lie afloat with her side touching the beach. A stranger wishing to enter the harbour should be furnished with a pilot.

A revolving light, visible 1½ minute, and dark ½ a minute, is exhibited in a light-house, of a square form, standing on the south end of the Outer Beaver, or William's Island. The lantern is 70 feet above the level of the sea, and the building is painted white, with two black balls on the seaward side to distinguish it in the day-time. In clear weather the light can be seen about 12 miles. From it Sambro' Lighthouse bears S. 84° 70′ W., 54 miles; Canso Lighthouse, N. 81° 39′ E., 70 miles; White Islands, S. point, N. 88° E., 9½ miles; Westernmost (dry) Bird Ledge, S. 84° W., 5 miles; Harbour Rock, N. 9° W., 3 miles; and Sutherland Island, S. point, N. 18° W.

A reef extends from the east end of Beaver Island a considerable distance, so that on entering the bay you should give the lighthouse a berth of three-quarters of a mile. Inside Beaver Island the anchorage is not very good, but farther up the bay there is a good anchorage by giving the light a berth of half or three-quarters of a mile, and steering N.N.W.

SHEET HARBOUR.—This harbour is 6 miles from the Beaver Lighthouse, and nearly half-way between Country Harbour and Halifax. It is very extensive, but for vessels approaching in thick weather is dangerous. Secure anchorage, on a bottom of mud, is afforded in the narrow channel between Sober Island and the main. Without the harbour are the several ledges shown on the charts: these ledges show themselves, excepting the outer one, named by the fishermen Yankee Jack, and which, when the sea is smooth, is very dangerous. It has been asserted, that a rocky shoal lies half a mile to the south of the Yankee, but its position has not been ascertained. Within the entrance is a rock, 2 feet under water, which will be avoided by keeping the Sheet Rock open of the island next within it, on the eastern side. In sailing or turning up the harbour, give the sides a very moderate berth, and you will have from 11 to 15 fathoms, good holding ground. The flood, at the entrance of Sheet Harbour, sets S.S.W. about one mile an hour. High water, F. and C., at 8h. 6m.; tides range from 4½ to 6½ feet.

MUSHABOON, to the westward of Sheet Harbour, is a small bay, open to the S.E., which affords shelter at its head only, in from 7 to 5 fathoms, muddy bottom. It is connected with Sheet Harbour by a passage, between an island and the main land. Here you may lash your vessel to the trees; and with the side touching the cliff, be perfectly sheltered from all winds. In going through the passage to Sheet Harbour, you must guard against a sunken rock at its mouth, which, from the smoothness of the water, seldom shows its position; this rock lies 400 yards off Banbury Islands, and may easily be cleared by keeping the Sheet Rock open of the island.

SPRY HARBOUR.—Cape Spry, or Taylor's Head, divides Mushaboon from Spry, or Taylor's Harbour. On the west side of the latter are two large islands, now named Gerard's and Phœnix Islands. Cape Spry is destitute of trees; and, being composed of large white rocks, is distinguishable afar off. From the point of the cape, westward, is a low shingly beach, which is shoal to a distance outward of one-third of a mile. When sailing into this harbour, you will perceive the land in the centre of the harbour, appearing like three distinct hills; keep the valley between the two easternmost on with the Bald Rocks, which will lead between Mad Moll Reef and Maloney Rock. You may then steer in for the anchorage at the western head of the harbour; where a fleet may lie land-locked on a muddy bottom. The tide, at the entrance of Spry Harbour, sets in with the velocity of about one mile an hour. This harbour is open to S.E. and S.S.E winds.

At the distance of about 3 miles, S.S.E., from Cape Spry is a dry rock, named by

the fishermen the Tailor's Goose. At about midway between it and the Beaver Island lie the Shag Ledges, which are partly dry, and extend nearly a league east and west. Within and about them the depths are from 20 to 7 fathoms.

DEANE, OR POPE'S HARBOUR, on the western side of Gerard's and Phœnix Isles above mentioned, has a ledge at its entrance, forming an obtuse angle at the two points, three-fourths of a mile from each, and from which a shoal extends to the southward half a mile. It may be passed on either side; but, on the west, care must be taken to avoid a shoal extending from the outer Tangier Island. The best shelter is under the small island about half way up the harbour on the eastern side, where there are from 8 to 6 fathoms, with good clay ground.

TANGIER HARBOUR, the next to Deane, or Pope's Harbour, is formed on the western side by craggy barren islands, which secure vessels from all winds. At about two miles from its mouth is a ledge that dries at low water. The anchorage is under the eastern shore above Fisher's Nose, in 5 to 4 fathoms, stiff mud.

SHOAL BAY (Saunders Harbour of Des Barres).—This bay has a good depth of water and excellent anchorage, on fine white sand and strong mud. The latter is to the northward of the island now named Charles Island, and vessels lie in it, land-locked, in 7 fathoms. Off the mouth of the harbour is a rock on which the sea always breaks; but it is bold-to, and may be passed on either side. Some parts of the harbour will admit large ships to lie afloat, alongside the shore, over a bottom of black mud.

SHIP HARBOUR is easy and safe to enter, and affords good anchorage in every part, the bottom being a tough clay of bluish colour; it leads to Charles River, above the narrows of which a fleet of the largest ships may lie alongside of each other, without the smallest inconvenience. The entrance, named by Des Barres Knowles' Harbour, is deep and bold: it lies between two islands, of which the eastern is Charles Island. Ship Rock, on the eastern side of the harbour, has a white cliff, which may be seen from a considerable distance in the offing, so that it is a good mark for the harbour: at first it resembles a ship under sail, but on approaching seems more like a schooner's topsail. There is good anchorage in every part of the harbour.

Charles Island, above mentioned, is a low rugged island, and ledges, partly dry, extend from it to the distance of $\frac{3}{4}$ of a mile: avoiding these, when entering, you may range along the western island, and come to an anchor under its north point, in 6 or 7 fathoms, the bottom of mud. Charles River commences about 7 miles to the N.W. of Charles Island, at a beach in the western shore, which has 6 fathoms close to its side; its entrance is one-third of a mile broad, widening as you ascend it. Above Green Island, on the western side of the river, are some shoals and ledges, but the anchorages below them are capacious and good.

OWL'S HEAD, OR KEPPLE HARBOUR, may be known at a distance by Owl's Head, on its western side, which appears round, abrupt, and very remarkable, while the neighbouring coast and isles are rugged and barren. The entrance is of sufficient breadth to allow a large ship to turn into it; and, when within the harbour, shipping lie land-locked in 6 and 7 fathoms, on a bottom of mud. In taking a berth be guided by the direction of the wind; as, with a S.W. gale, the western anchorage is to be preferred, and the eastern with a S.E. The tide sets into this harbour from the S.W., at the rate of one mile an hour. It is high water at Owl's Head at 7h. 50m.; the tide ranges from $4\frac{1}{2}$ to $6\frac{1}{2}$ feet.

Little Harbour is somewhat to the westward of Owl's Head Harbour, and is a place of safety for small vessels; but its entrance is intricate, and requires a good knowledge of the passages leading to it, to enable a vessel to enter.

JEDORE HARBOUR (Port Egmont of Des Barres).—The entrance to this harbour is unsafe and intricate; a shoal of only 11 feet lies at its mouth; the channel within is narrow and winding, and there are extensive mud flats, covered at high water, and uncovered with the ebb; hence a stranger can enter with safety only at low water, the channel being then clearly in sight, and the water sufficient for large ships. The best anchorage is abreast of the sand-beach, 2 miles within the entrance in from 9 to 6 fathoms, on a bottom of stiff mud. Two miles and a half above the beach the harbour divides: one branch, on the port hand, is navigable nearly to its extremity, and has several sunken rocks in it; while to the starboard is a large space, with a clear bottom and from 3 to 5 fathoms. On the eastern shore are Oyster Pond and Navy Pool, two deep inlets, but choked at their entrance by a bed

of rocks: the river terminates with a rapid. In the offing, at the distance of two leagues from the land, the body of the flood sets in S.W. by S., at the rate of half a mile an hour. It is high water at Jedore Head at 7h. 45m.; the tide ranges from $4\frac{3}{4}$ to $6\frac{1}{2}$ feet.

Without the entrance, on the eastern side, are two isles, named Roger and Barren Islands, between and within which the passages are good, and afford shelter in case of necessity; from these the land runs nearly E.N.E. and forms a deep inlet, named Clam, or Clamb Bay.

The Brig Rock is a very dangerous rock, of 3 feet, lying S.E. $\frac{3}{4}$ S. from the extremity of Jedore Head, and S.W., 2 miles, from the centre of Long Island. The weed on the top of it may frequently be seen. The marks for this rock are, a house and barn in Clam Bay, just open of the east end of Long Island, bearing N. 5° E., and the house on Jedore Head open to the N.E. of Jedore Rock.

Polluck Shoal.—At about 9 miles south from Jedore Head is a reef, named the Polluck Shoal, the area of which is about an acre, and there is a depth of 24 feet over it. During a swell, the sea breaks on it with great violence.

Jedore Ledges.—Those advancing between the Brig Rock and Polluck Shoal should be cautious in approaching any of the Jedore Ledges, which are said to extend from 5 to 9 miles from the mouth of the harbour.

Between Jedore and Halifax there are no harbours of any consideration for shipping, but there are numerous settlements. The best harbour is that named *Three-fathoms Harbour*, which has occasionally received large vessels in distress. This harbour lies immediately to the east of an islet named Shut-in Island; and, with the wind on shore, is difficult and dangerous; so that it is to be attempted only in cases of extreme distress. The channel lies two-thirds over to the northward from Shut-in Island, and turns short round the starboard point to the westward. When you are within this harbour the passage will be found to be clear, between banks of soft mud; but it is only fit for schooners and sloops, although it has occasionally been visited by large vessels. The anchorage is tough blue clay. In beating to windward, ships may stand to within $1\frac{1}{2}$ mile of the shore, the soundings being tolerably regular, from 20 to 12 and 8 fathoms.

In the remark book of H.M.S. Carnation, July, 1821, an account is given of a rocky shoal, which that vessel passed over, in 8 fathoms water, and upon which were taken the following bearings:—Jedore Head, N.N.W. $\frac{1}{2}$ W.; west end of Long Island, N.E. by N.; and Jedore Outer Ledge, or Brig Rock, E. by S. This shoal may have less water upon it in other parts; but as these bearings do not agree with the charts, we apprehend there must be some error in its exact position. Mention is also made of a rock seen by H.M.S. Leander, June, 1787, bearing from Jedore Head S. 38° E., distant 6 miles, which has only 5 feet over it, and 22 fathoms close within and without it; this is supposed to be the Brig Rock, but if so, the bearings are not correct. These two notices are inserted, to show that some dangers exist hereabout, and will be sufficient to warn the mariner to search for, and cautiously avoid them.

HALIFAX HARBOUR lies about 120 miles westward of Cape Canso, and 113 miles eastward of Cape Sable, and is one of the finest in British America. It is easy of approach and accessible at all seasons, and is large enough to accommodate almost any number of vessels in perfect security. Its direction is nearly North and South, and its length about 14 miles. The channel up to the town is nowhere less than $\frac{1}{3}$ a mile broad, nor under 6 fathoms in depth, except in two places where there are only $4\frac{1}{2}$ fathoms; these are named the Neverfail and Middle Shoals. Its upper part, known by the name of Bedford Basin, is a beautiful sheet of water, containing about 10 square miles of good anchorage. The town of Halifax is the capital of Nova Scotia, and contains above 18,000 inhabitants. High water on the days of full and change at 7h. 49m.; springs rise 6 and neaps $4\frac{1}{2}$ feet.

The land about the Harbour of Halifax, and a little to the southward of it, is in appearance rugged and rocky, and has on it, in several places, scrubby withered wood. Although it seems bold, it is not high, as it is only to be seen from the quarter-deck of a 74 gun-ship at 7 leagues' distance; excepting, however, the high lands of Le Have and Aspotogon, which have been seen 9 leagues off. When Aspotogon highland, which has a long level appearance, bears North, distant 6 leagues, an E.N.E. $\frac{1}{2}$ E. course will carry to Sambro' Lighthouse.

The entrance of the harbour is between Chebucto Head and Sambro' Island on the western, and Devil's and Macnab's Islands on the eastern side. *Sambro' Island* is small

and rocky, lies 4 miles S.W. of Chebucto Head, and is surrounded by a multitude of rocks and shoals, bearing the general name of Sambro' Ledges, through and among which are deep water passages, but too intricate for a stranger to attempt. To avoid them, give the island a berth of at least 3 miles. Pilots may be obtained from Sambro' Island, and if a vessel fires a gun during a fog, it will be answered therefrom. *Devil's Island* lies close off Hartland Point, is small and rocky, and connected with the main by a flat nearly dry at low tide; in passing give it a berth of $\frac{1}{8}$ of a mile or more. *Macnab's*, or Cornwallis Island, forms the eastern side of the channel into the harbour, and is connected with the eastern shore by a flat of 8 to 12 feet, upon which is situated the little island named Lawler. The passage on this side of the island, named the South-east Passage, is too shallow and confined to be used by any but boats, so that vessels always use the western passage into the harbour. From the south end of the island a shoal extends about $1\frac{1}{4}$ mile to the southward, and upon this flat there is a small island, named the Thrum Cap. Northward of Macnab's Island is *George Island*, a small island lying nearly in mid-channel opposite the town. Close off it there are 4 to 8 fathoms, and in the channel between it and the town are 8 and 14 fathoms, while to the eastward of it are from 10 to 14 fathoms; both channels being free from danger to within a cable's length of either shore.

Lights.—Sambro' Island has a white octagon-shaped lighthouse upon the middle of it 60 feet high, showing a fixed light at 115 feet above the level of the sea, visible 20 or 21 miles.

On the southern end of Devil's Island there is a building painted brown, with a white belt, from which a light, appearing red towards the sea, is shown at the height of 45 feet above high water, visible about 8 miles. From this island pilots may be obtained.

Near the extremity of Maugher's Beach, a gravel spit extending from the middle of the western side of Macnab's Island, there is a white circular tower having a red roof, from which a fixed light is shown at the height of 58 feet above the sea, visible 10 miles. When Sambro' Light bears W.S.W., this light should not be brought to the westward of North, and it will clear the Portuguese, Rock Head, and Thrum Cap Shoals.

Dangers.—The rocky promontory of Chebucto Head, south-westward of which, and around Sambro' Island, are numerous rocks and shoals, must always be carefully approached when entering the harbour from the westward. The assistance of local knowledge is absolutely requisite to enable you to sail among these dangers, and, therefore, a stranger should give Sambro' Island a berth of 3 or 4 miles in passing, and not attempt any of the channels inside them.

Bell Rock.—This is a small rock of 6 feet, lying $\frac{4}{10}$ of a mile from the shore, nearly midway between the entrance to Catch Harbour and Chebucto Head. In a northerly direction, towards the coast, it has a spit of $4\frac{1}{2}$ fathoms, extending from it a short distance, but in other respects it is steep-to, there being 7 and 8 fathoms close to its eastern, and 13 and 24 fathoms close to its western, side. Between it and the shore there are 14 and 8 fathoms, but no ship should attempt to pass inside it, on account of the dangerous rocks, named Duck and Duncan Reefs, which extend from the land and nearly block up the passage. Bell Rock bears from the extremity of Chebucto Head nearly S.S.W. $\frac{1}{4}$ W. one mile, and from White Head, the east point of Catch Harbour, E. $\frac{1}{4}$ N. about $\frac{1}{2}$ a mile. To avoid it on the east side, do not go to the westward of the line of Sandwich Point in one with Chebucto Head, about N. $\frac{1}{2}$ E., as that mark will carry you clear of it, and also to the eastward of the Sisters, and the other ledges in the vicinity of Sambro' Island.

Portuguese Shoal.—This is a small shoal of $4\frac{1}{2}$ or 5 fathoms, the outermost of those lying before the entrance to the harbour. It lies 3 miles S.W. $\frac{1}{2}$ W. from the lighthouse on Devil's Island; 4 miles S. $\frac{1}{2}$ E. from the lighthouse on Maugher's Beach; and $2\frac{1}{2}$ miles N.E. $\frac{1}{4}$ N. from the extremity of Chebucto Head. Close-to it all round are 6 and 7 fathoms. Its western side is marked by a black buoy, lying with George Island open a little westward of the light on Maugher's Beach.

Rock Head.—This shoal lies nearly $\frac{3}{4}$ of a mile to the E.N.E. of the buoy on the Portuguese Shoal. It is about $\frac{1}{4}$ of a mile in extent, and has $3\frac{1}{2}$ to $4\frac{1}{4}$ fathoms upon it, with 6 to 10 fathoms close-to all round. To clear it, as well as the Portuguese Shoal on the east side, bring Sambro' Lighthouse Island open east of White Head, bearing S.W. $\frac{1}{2}$ W. A black buoy with white bell and frame is placed on its south-eastern side.

Lichfield Rock.—This small shoal lies on the western side of the approach to the harbour at rather more than $\frac{3}{4}$ of a mile from the shore, in the direction of S.E. by S. $\frac{1}{2}$ S. from the mouth of Herring Cove. It has upon it $2\frac{1}{2}$ fathoms, and there are 9 to 16 and 17 fathoms at a short distance from it, the deepest water being between it and the coast, where there is as much as 20 fathoms. It is marked by a white beacon buoy, moored on its eastern side.

Neverfail Shoal.—This is a shoal of $4\frac{1}{2}$ fathoms, lying in the middle of the approach to the harbour, at nearly midway between the Lichfield Rock and the Thrum Cap Shoal. It has 5 and 6 fathoms immediately around it, and, we believe, at present is not marked by a buoy. You may sail between it and the Lichfield Rock by bringing the flag-staff of the Citadel open east of Sandwich Point, bearing N. $\frac{1}{4}$ W., or, between it and Thrum Cap Shoal, by bringing George Island open a little to the westward of Maugher's Beach Lighthouse.

Mars' Rock.—This rock lies southward of and under Sandwich Point, the western point of the harbour, at from $\frac{1}{4}$ to $\frac{1}{2}$ a mile from the land. On its shoalest part there are $3\frac{1}{2}$ fathoms, and immediately around it are 8 and 10, deepening to 19 and 20 fathoms. Its eastern edge is marked by a white beacon buoy.

Thrum Cap Shoal.—This is a shallow flat of $1\frac{1}{2}$ to 3 fathoms, extending a mile to the S.S.W. from the south end of Macnab's Island, on the eastern side of the harbour. It must be carefully avoided when making the harbour from the eastward, and the red beacon buoy on its edge should always be passed on its south side.

Maugher's Beach.—From the south side of this beach a flat of $2\frac{1}{2}$ to $4\frac{1}{2}$ fathoms extends about $\frac{1}{2}$ a mile, and has on it, near the extremity, a patch of $3\frac{1}{4}$ fathoms. To clear this flat when running into the harbour, bring the Roman Catholic Chapel, at Dartmouth, in one with the east point of George Island, bearing N. $\frac{1}{4}$ E., and you will avoid it in 10 or 11 fathoms. There is also a shoal running $1\frac{1}{2}$ cable's length off from the northern side of the beach, and named the Horse Shoe Reef.

The Middle Ground is a small gravelly patch of $4\frac{1}{2}$ fathoms, lying right in the fairway of the channel, with Maugher's Beach Lighthouse bearing S.E. by S. $\frac{1}{4}$ S., distant $\frac{3}{4}$ of a mile; close-to all round are 6 and 7 fathoms. It extends East and West a cable's length, and is about 30 fathoms broad; as you fall off to the eastward of it you will have from 7 to 13 fathoms water, muddy bottom, while on the west side there are from 10 to 14 fathoms, coarse and rocky bottom.

Pleasant Shoal extends from Pleasant Point nearly half way over towards the north-west end of Macnab's Island. There are but 3 and 4 feet over it in many parts, but its extremity is marked by a white buoy which should always be left on the port hand in entering.

Reed's Rock, a small rock having 4 feet over it, lies in-shore, about half way between Point Pleasant and Halifax. The thwart-mark for it is a farm-house in the wood over a black rock on the shore, bearing W. by S. There are 5 and 7 fathoms around it, and a white beacon buoy is moored off its eastern side.

Ives Knoll has but one foot of water over its centre, and from 9 to 15 feet on other parts; it lies off the north end of Macnab's Island, separated therefrom by a narrow channel 4 and 5 fathoms deep, and on its western side there is a red buoy, moored opposite the white one marking Reed's Rock.

Belleisle Spit extends $\frac{1}{4}$ of a mile from the shore at the south end of Halifax, opposite the south point of George Island, and has a white beacon buoy on its outer edge. One-fourth of a mile further in, on the same side, is the white beacon buoy on the edge of the Leopard Shoal.

DIRECTIONS.—No vessel ought to attempt the harbour of Halifax without having a local pilot on board. In the event of not being able to get one, the following directions may be serviceable.

In sailing into Halifax Harbour from the westward, you should advance to the eastward so as to pass Sambro' Lighthouse at the distance of a league, taking care not to approach nearer to it on account of the various dangers in its vicinity. When the lighthouse comes to the westward of N.N.W. you may proceed N.E. or N.E. $\frac{1}{2}$ N. about $4\frac{1}{2}$ miles, which will bring you off Chebucto Head. Here you will bring the leading mark on, which is the Citadel Flagstaff, just open of Point Sandwich, N. $\frac{1}{4}$ W., and, by keeping them thus open, you will pass between the Portuguese black buoy, and the Neverfail and Thrum Cap Shoals on the starboard, and Lichfield white beacon buoy on the port hand, up to the white beacon buoy on the edge of Mars' Rock, which must be left also on the port side by opening the flagstaff a little more to the eastward.

Sandwich Point, which is bold-to, may now be approached, and passed at the distance of a cable's length, and by keeping Chebucto Head a little open of Sandwich Point, about S. ¾ W. you will continue in the fairway up to George Island, leaving the Middle Ground a little on your eastern side, and the white buoys on Pleasant Shoal and Reed's Rock on your western. Or, when up with Mars' Rock buoy, you may haul to the eastward and bring Dartmouth Roman Catholic Chapel in one with the east point of George Island, N. ¼ E., which will lead in between Maugher's Beach or Lighthouse Bank and the Middle Ground, up to abreast the town, passing the red buoy on Ives Knoll on the starboard side, and the white ones on Pleasant Shoal, Reed's Rock, and Belleisle Spit on the port side.

Or, when abreast of Chebucto Head, or when Sambro' light bears W.S.W., the light on Maugher's Beach should never be brought to the westward of North. Keeping the light from North to N. by E. will lead in clear of all the shoals, except the Neverfail, up to abreast Sandwich Point. Those advancing from the westward will see the light on Maugher's Beach, when they are as far up as Chebucto Head; it is then a good mark up to Sandwich Head.

*In sailing into Halifax Harbour from the eastward,** especially with an easterly wind, and intending to pass in between the Rock Head and Thrum Cap Shoals, steer towards Devil's Island, leave it ½ a mile to the northward, and steer West, making due allowance for the influence of the tide. If this course be made good you will pass above a mile northward of the bell buoy on the south end of Rock Head Shoal, and one-third of a mile southward of the red buoy off the south-west end of the Thrum Cap. As soon as George Island appears open westward of Maugher's Lighthouse, haul up and proceed on that line of bearing, and as you near Sandwich Point, open the island gradually more to the westward, till the Roman Catholic Chapel comes in line with the east end of George Island, then proceed as before directed.

In turning to windward, give the upper or inner part of Maugher's Beach a berth of 2 cables' lengths, in order to avoid the Horse-Shoe Reef, that runs from the north part of the beach to the distance of 1⅓ cable's length. You may stand to the Sandwich Point side to within two ships' length, that being bold-to; but stand no farther over to the westward, to avoid Point Pleasant Shoal, than keeping Chebucto Head well in sight without Sandwich Point.

When up with George Island pass it on either side, as most convenient, giving it a berth of 80 or 100 fathoms, and choose your anchorage at pleasure, in from 13 to 6 fathoms, muddy bottom. From George Island into Bedford Basin there is no obstruction to shipping, if a moderate berth be given to the shores.

Ships of war usually anchor off the Naval Yard, which may be distinguished at a distance by the masting sheers. Merchant-vessels discharge and take in their cargoes at the town-wharves.

Small vessels, from the eastward, occasionally proceed to Halifax by the S.E. passage, within Macnab's Island, and on the eastern side of Lawler's. On the shoalest part of the bar of sand, which obstructs this passage, there are, however, but 8 feet at low water. Above the bar the depth increases to 5 and 10 fathoms, bottom of mud. On the bar of the channel between Macnab's and Lawler's Islands there are but 3 feet at low water.

Herring Cove, on the western side of the harbour, 1¼ mile south-westward of Sandwich Point, has an entrance about 100 fathoms wide, and quite bold on either side, with 7, 5, and 4 fathoms up to the elbow that forms the inner cove, where small vessels may lie in perfect security in a depth of 7 to 9 feet.

In *Macnab's Cove*, formed by an indent of the island on the northern side of Maugher's Beach, there is good anchorage in from 9 to 4 fathoms, muddy bottom. The

* It is said that there is great difficulty in making Halifax from the eastward, particularly in the winter season, in consequence of the winds being too frequently from the W.S.W. to N.W., and blowing so hard as to reduce a ship to very low canvas, if not to bare poles, and should the wind come to the eastward, it is invariably attended with such thick weather as to prevent an observation, or seeing to any great distance: hence, under such circumstances, it would be imprudent to run for the shore, more particularly in winter, when the easterly winds are attended with sleet and snow, which lodge about the masts, sails, rigging, and every part of the ship, becoming a solid body of ice so soon as the wind shifts round to the N.W., which it does suddenly from the eastward. These are circumstances of real difficulty; and it has been recommended, in such a case, to run far to the south-westward (avoiding the Gulf Stream), and thence from the S.W. coast, to keep the shore on board, all the way to Halifax.

best spot is represented to be in 7 fathoms, with the extremity of Maugher's Beach touching Sandwich Point, and the tower on George Island touching Ives Point.

Mr. Davy, R.N., of H.M.S. Cornwallis, made the following remarks while proceeding from Halifax to Quebec. The Cornwallis left Halifax on June 4th, 1838:—

"Wind north with fine weather, sailed with Pearl, Dee, and Charybdis for the Gut of Canso. Passed out between the Thrum Cap and Rock Head Shoals to within a cable's length of the Thrum Cap buoy, having 10 fathoms water; this channel is quite safe. Being thus clear, 27 miles led us to the southward of the Jedore Shoals; then East for White Head, wind and weather looking favourable. Just to the eastward of Cole Harbour* is a remarkable red cliff, making in a well-formed saddle; the red is bright, and the eastern coast, thereby, is easily recognised; while the coast to the westward of Halifax is known by its white cliffs. It is advisable for strangers running from Jedore to Canso, not to approach the coast nearer than 10 miles, until abreast of Tor Bay. This is a spacious bay, having Berry Head at its western point and Cape Martingo at its eastern, 5 miles apart. White Head Island, immediately to the eastward of Tor Bay, is the most remarkable land on the coast, and is as a beacon to the pilots; it stands well out, and from the westward terminates the eastern view. Being 10 miles south of it, steer N.E. by E. for Canso Lighthouse, which is a tall white building, and makes well out to seaward, on a small low island, named Cranberry Island. It exhibits good fixed lights, which must be brought to bear West before keeping away; then steer N.N.W., until George Island bears West, thence N.W. and N.N.W. for Cape Argos, avoiding the Cerberus Shoal, which is very dangerous, and directly in the track; leave it on your port hand. Cape Argos makes like a round island, and is bold to approach; passing this, the distance across the gut becomes narrowed to 1½ mile."—*Naut. Mag.*, 1839, p. 299.

Catch Harbour.—At 1½ mile south-westward of Chebucto Head is the small harbour or cove named Catch Harbour, which has a bar of 9 feet at low water, right across the entrance, over which the sea breaks heavily, when the wind blows on shore. Within the bar there are 2 and 2½ fathoms. This harbour is too small, and the access to it is too difficult, to allow it to be frequented by any but the smallest vessels. At its head there is a stream of good fresh water.

Coast westward of Halifax.—On the coast from Halifax, westward, to Margaret's Bay, the country appears, from the offing, very rocky, with numerous inlets, the shore being steep-to, and bounded with white rocky cliffs. The high lands of Aspotogon, on the east side of Mahone Bay, are very remarkable; and proceeding eastward from Mahone Bay the rocks which surround the shore are black, with some banks of red earth. Between Cape Le Have (which is a remarkable promontory, 107 feet above the sea, bald on the top, with a red bank under it, facing the south-westward) and Port Metway, there are some hummocks inland, about which the country appears low and level from the sea; and, on the shore, white rock and stony beaches, with several low bald points; hence to Shelburne Harbour the land is woody. About the entrance of Port Latour, and within land, are several barren spots, which, from the offing, are easily discerned; thence, to Cape Sable, the land appears level and low, and on the shore are some cliffs of exceedingly white sand, particularly at the entrance to Port Latour, and at Cape Sable, where they are very conspicuous from the sea.

SAMBRO' HARBOUR.—This harbour lies 1¾ mile to the N.N.W. of Sambro' Island. The Bull Rock, already noticed, lies off its entrance, and there are other rocks between the latter and Sambro' Island. The best channel into it is, therefore, between Pennant Point and the Bull Rock; but vessels from the eastward may run up between Inner Sambro' Island and the Fairweather Rock. An islet, named the Isle of Man, lies within the entrance, and must be left, when sailing inwards, on the left, or port hand. The anchorage is above this islet, in 4 to 5 fathoms, muddy bottom. This place is generally the resort of coasters in bad weather. From the anchorage you may run through the narrow passage in 2 and 3 fathoms water, and so enter Sambro' Basin.

The passages between the rocks and ledges lying to the southward of Sambro' Harbour may oftentimes conduce to the safety of vessels making the land by mistake so far to the westward of the light as to be unable to clear the dangers southward of it, but

* A very shallow bay 4 miles eastward of Devil's Island.

should be attempted only in cases of emergency; the depth of water is sufficient for the largest ships, but great prudence is required.

PENNANT HARBOUR (named Port Affleck by Des Barres) is situated round the point to the westward of Port Sambro', but, although it possesses good anchorage, it is but little frequented. The islands on the western side of it are bold-to, the ground is good, and the depth of water is generally from 5 to 10 fathoms. It is extensive, and safe in bad weather, and the dangers are all visible. At its further end there is an inlet named Dagge Cove.

TENANT BAY (or Bristol Bay), between Pennant Harbour and Tenant Basin (Shuldham Harbour of Des Barres), has an entrance obstructed by several rocks and islets, but, once gained, it is extensive and safe; and in bad weather the dangers show themselves. There is anchorage in 9 fathoms; the ground a tough blue clay. When entering, the land presents, to the eye of the stranger, the rudest features of nature. It is high water on the days of full and change of the moon at 7h. 45m., and the tides rise above 8 feet.

PROSPECT HARBOUR is situated about $2\frac{3}{4}$ miles to the westward of Tenant Bay, from which it is separated by a large cluster of islands and broken land, the outer extremity of which is named Cape Prospect, or Mars' Head. On approaching, Prospect Harbour presents a rugged, broken appearance, but it is safe and extensive, and in rough weather the dangers mostly show themselves. Vessels coming from the eastward and rounding Cape Prospect, must beware of a rock with 17 feet over it, lying South, about one-third of a mile from the cape; go not between it and the cape, but proceed on its southern side in 20 and 21 fathoms water, and by keeping more than half a mile from the land you will steer quite clear of danger, and may sail boldly up its eastern channel between Prospect and Betsy's Islands; having passed these, the channel narrows: the western passage is between Hobson's Nose and Dorman's Rock. There is good anchorage for large ships above Pyramid Island, and also for small vessels, within Betsy's Island, in $4\frac{1}{2}$ fathoms, stiff blue clay. There is a breaker, with 3 fathoms over it, at the distance of two cables' lengths to the eastward of Dorman's Rock.

SHAG HARBOUR (Leith Harbour of Des Barres), the next westward of Prospect Harbour, is the N.E. arm of an inlet, of which the N.W. arm is Blind Bay; in both excellent anchorage may be found. The Hog, a sunken rock, lies in the common entrance without, and has only 6 feet of water over it; it bears S.E. $\frac{1}{2}$ E., nearly $1\frac{1}{3}$ mile from Taylor's Island (Inchkeith). In rough weather, with the wind on shore, the sea breaks over it; and, in fair weather, it may be perceived by the rippling of the tide. There is a good channel on either side, but that on the west side is the most difficult, there being a ledge extending half a mile towards it, E.S.E. from the eastern extremity of Taylor's Island.

DOVER PORT lies on the western side of the entrance to Blind Bay: it is formed by Taylor's Island and several other islands, and affords good and safe anchorage. The eastern passage is the best, and when sailing in, give a berth to the reef, which extends S.E., half a mile, from Taylor's Island. The anchorage is within the body of Taylor's Island, in 10, 9, or 7 fathoms, muddy bottom. The western entrance, at the west end of Taylor's Island, has numerous sunken rocks in it, and the water being shallow it should not be attempted.

The coasts, between Halifax and this place, are craggy, broken, and barren; the shore also is iron-bound and steep, and a tree is scarcely to be seen. Fish, however, are abundant, and the harbours are conveniently situated for the fishery.

MARGARET'S BAY.—This bay is about 25 miles in circumference, 9 miles in length, and with an entrance about 2 miles wide. The water in it is deep, and in various parts of it there are harbours capable of receiving the largest vessels, which may frequently lie close to the shore. On the west side of the entrance is the high land of Aspotogon, the summit of which, estimated to be 438 feet above the sea, is very conspicuous, and may be seen 18 to 25 miles off, so that it is a good mark for this part of the coast. If brought to bear N.W. (true) this high land will lead directly to the entrance of the bay. The land on either side of the entrance consists of high rocky cliffs, which are steep-to, with deep water of 6 to 10 fathoms immediately off them: it is not, however, prudent to go close to the shore, as the examination of the bay was but indifferently executed, and there may be sunken dangers unfound by the surveyors. The principal anchoring places in the bay are Head, Hubbert's, and North-west Harbours.

On the western side of the entrance to Margaret's Bay is a small rocky island, named South-west or Holderness Island, which is about 50 feet high, and steep-to. At nearly half a mile to the eastward of this is a 4-fathom danger, on which the sea breaks in rough weather; but as there is so much water over it, it can scarcely be called a danger, except to deeply-laden vessels. Between South-west Island and the shore small vessels may pass, but care is necessary to avoid a patch of 3 fathoms, lying nearly in mid-channel.

On the eastern side of the entrance to the bay, there is a rock which dries at low water, lying about 300 yards from East Point, and having close to it 5 and 7 fathoms. And in the middle of the entrance to the bay, at about $1\frac{1}{2}$ mile to the southward of South-west Island, is a ledge of rocks named the Horse-shoe, part of which is above water, shelving on all sides; this rocky ledge has 6 and 8 fathoms close to it, and in bad weather the sea breaks over it with considerable violence.

At about $2\frac{1}{4}$ miles to the northward of East or May Point, on the eastern side of Margaret's Bay, is Peggy's Point, and at a mile beyond this is Shut-in Island 208 feet high, which is covered with wood and bold-to; but there are two ledges between it and the inner part of Peggy's Point, over which the depths are 8 and 9 feet. In a southerly gale the water is smooth on the lee side of the island, and the bottom good. At $1\frac{1}{2}$ mile, N.E. $\frac{1}{2}$ N., from Shut-in Island is a smaller isle, named Luke's, forming a complete break to the sea, and used as a sheepfold; there is good anchorage on the N.E. side of it, smooth in all seasons; this, therefore, is a usual place of shelter. Within two miles northward of Luke's Isle are the Strelitz Isles of Des Barres, but the principal of these are now named Jollimore's Isles. A reef extends north-eastward from the latter, and the land within forms the harbour named Hertford Basin, wherein the depths are from 7 to 10 fathoms, and the anchorage is safe under the lee of Jollimore's Isles.

Head Harbour, or Delaware River, situated in the N.E. corner of the bay, is an excellent anchorage, and so safe a place that a fleet might be securely moored in it side by side, and unaffected even by a hurricane. The lands are high and broken, and Moser Islands, at the entrance, are used as sheepfolds.

Hubbert's Cove, the Fitzroy River of Des Barres, is situated in the N.W. corner of the bay, and may be entered by a stranger, by keeping the western shore on board: and a ship dismasted or in distress may here find shelter. If without anchors, she may safely run aground, and will be assisted by the settlers. At the entrance of the cove, towards the eastern side, is a ridge of rocks named Hubbert's Ledge (Black Ledge), which is about 100 fathoms in extent, and covered at high water: it may be passed on either side, keeping the land on board, the shores being bold.

Long Cove (Egremont Cove) is $2\frac{1}{2}$ miles to the southward of Hubbert's Cove, and affords good anchorage with a westerly wind. To the southward of Long Cove the coast is bold and rugged, without any danger, except a small rock, of 6 feet water, which lies close in to the land.

North-west Harbour is situated about a league to the southward of Long Cove, and its entrance is divided into two channels by a small island named Horse Island. On either side of the island there is a good passage with 10 fathoms water; and good anchorage, adapted for small vessels, may be obtained behind it, in from 6 to 9 fathoms, or farther up, in 5, 4, or 3 fathoms. The south point of entrance to North-west Bay is formed by Owl's Head, which is an abrupt precipice, with deep water close to it.

To the north-westward of South-west Island is what is commonly named the South-west Harbour, which is formed by Owl's Head and the shore. Owl's Head is literally a rocky island, separated from the main by a very narrow passage, not even navigable for boats. Here are 5, 6, and 7 fathoms water; but the place is seldom frequented.

Vessels from the eastward bound for Margaret's Bay, usually go in between the Horse-shoe and East Point. A northerly course will carry you midway between right up to the head of the bay, without encountering any danger, except those already described.

ASPOTOGON HARBOUR.—This harbour lies to the westward of South-west Island, but is too shallow for ships. At its entrance are Black, Saddle, and Gravelly Islands and Shoals, to the southward of which is Seal Ledge, a shallow and dangerous shoal lying W. $\frac{1}{2}$ N., $2\frac{3}{4}$ miles from the Horse-shoe, and W.S.W. $\frac{1}{2}$ S., 3 miles, from the southern part of South-west Island.

At the distance of 5 miles, W.S.W. ½ S., from the south point of South-west Island is Iron-bound Island, which is about a mile long, narrow, and steep-to. It lies S.S.E. ½ S., 1½ mile from New Harbour Point, the extremity of the peninsula which divides Margaret's and Mahone Bays; between is a good channel of from 6 to 17 fathoms water, the ground consisting chiefly of black mud.

Green Island, which is small, lies S. ½ E., 3 miles, from Iron-bound Island; S.W. by S., 7 miles, from South-west Island; W.S.W., 9 miles, from Taylor's Island; and W.N.W. ¾ W. from abreast of Sambro' Lighthouse. There is said to be a shoal of only 2 fathoms, midway between Iron-bound and Green Islands, but its exact position is not accurately known, and therefore it is omitted in the charts. The probable existence of such a danger ought to be guarded against; there is otherwise water sufficiently deep for any vessel.

MAHONE BAY is divided from Margaret's Bay by the peninsula, on which stand the high lands of Aspotogon, the appearance of which in three regular swellings is very remarkable at a great distance in the offing. This bay extends nearly 4 leagues from N.E. to S.W., and contains numerous islands and rocks, the largest of which, Great and Little Tancook Islands, are on the eastern side. Green Island, above mentioned, lies without the entrance; another small isle, named Duck Isle, is situated on the opposite side; and a larger, named Cross Island, is situated more to the westward. There is a channel, one mile in breadth, between the two latter.

The Outer Ledge, which always breaks, lies N.E. ½ E., 1⅔ mile, from the east end of Duck Island, and W. ½ N., 3 miles, from the west point of Green Island. The Bull Rock, another danger, lying at a mile to the southward of Great Tancook, bears from Green Island N.W. ½ W., 4½ miles, and from the east end of Duck Island N. ¾ E., 4 miles: this rock is visible at one-third ebb, and from it the S.W. end of Flat Island bears E. by N., 1200 fathoms distant, and the west point of Tancook Island N. by W., 1¾ mile distant. Further up, N.W. by W., 400 fathoms distant from the west point of Tancook Island, lies Rocky Shoal, between which and Tancook Island there is deep water. At 1¼ mile north of Great Tancook is a sunken ledge, named the Coachman, which is visible at low water only; the east ends of Great Tancook and Flat Island in one will lead you clear on the east side of this ledge; the west end of Iron-bound Island open with the west point of Little Tancook will lead you clear to the southward; and Governess Island on with the west point will carry you safe on its north side.

At the head of Mahone Bay are a number of little islands, more or less connected together by rocky reefs. Behind these islands is the small town of Chester, having in its vicinity a fertile and well-wooded country. Among the islets there is good anchorage, and here vessels frequenting the bay generally ride; the various anchorages, however, require care to get to them.

To run into Mahone Bay, you ought to have a pilot on board, as an attempt to do so without cannot be unattended with risk. When approaching from the eastward, the first land seen will be Green Island, which is round, bold, and moderately high. Hence to Iron-bound and Flat Islands, both steep-to, the distance is about 3 miles; passing these you proceed to and between the Tancook Islands, which are inhabited: the passage is good, and there is anchorage, under the isles, in from 12 to 7 fathoms. On proceeding towards Chester, the only danger is the ledge named the Coachman, above mentioned. Chester Church open of the west side of Great Tancook, leads clear to the westward of the Bull Rock, and down to Duck Island. The islands off the town render the water in the harbour smooth and pleasant; when within, the depth is from 5 to 2 fathoms.

It is high water on the days of full and change of the moon, in Margaret's and Mahone Bays at 8h.; and the vertical rise of tide is from 7 to 8 feet.

LUNENBURG OR MALAGUASH BAY.—This bay lies outside the entrance to Mahone Bay on the western side, and is about 3¾ miles in extent, with a depth of water over its surface of 10 to 7, decreasing to 6 and 5 fathoms, which latter depth is at its head. Although the bay is easy of access, yet the assistance of a pilot ought to be obtained when running in, as there are several dangers to be avoided, for which of course local knowledge will be the best guide.

At the entrance to the bay is Cross Island, which is about 30 feet high, and has on its north-east side a nook, where coasters may lie securely. The Hounds' Rocks lie off this part, and must have a berth in passing. The west and south sides of the island are bold, and there is an excellent fishing-bank at 2 miles from its southern end, on

which are from 14 to 17 fathoms water. On the S.E. point of the island is a lighthouse, in lat. 44° 20′ N., and long. 64° 7′ W. The tower is of an octagonal shape, painted red, with two lights placed vertically, 33 feet apart. The lower light is fixed, and the upper one flashes at intervals of a minute, appearing bright 45″ and dark 15″. The lighthouse is a station for pilots.

In sailing into Lunenburg Bay, you may pass on either side of Cross Island; but the channel on the west side of the island is the best, as it is the widest. In sailing through the northern channel, be careful to avoid the shoals which extend from the north side of the island, and also those extending from Colesworth Point on the opposite side. In sailing in through the channel to the westward of the island, steer midway between it and Rose Point: and before you approach the next point, which is Ovens' Point, give it a berth of two or three cables' length, because there is a shoal round it, to which you must not approach nearer than in 7 fathoms. From Ovens' Point N.E., three-quarters of a mile distant, lies the Sculpin or Cat Rock, dry at low water. Your leading-mark, between Ovens' Point and the Cat Rock, is a wagon-roadway (above the town of Lunenburg), open to the westward of Battery Point, which mark will keep you clear of a rock of 4 fathoms at low water. The best anchoring ground is on the west shore, opposite the middle farm-house, in 7 fathoms, muddy bottom. Your course in is from N.N.W. to N.W. by N. In this bay, with good ground tackling, you may ride out a S.E. gale very safely. The harbour, which is to the northward of the Long Rock and Battery Point, is fit only for small ships of war and merchant vessels. Along the wharves are 12 and 13 feet of water, and at a short distance off, from 20 to 24 feet, soft mud.

It is high water on the days of full and change of the moon at 8h.; and the tides rise from 6 to 8 feet.

DARTMOUTH BAY is situated between Ovens' and Rose Points, and has some settlements about the shores, and also on an island at the bottom of the bay. It is easy of access, and you may anchor abreast of the island, in 3, 4, 6, or 7 fathoms. In sailing into the bay it is advisable to borrow somewhat towards the Rose Point shore, because of the shoals which lie to the southward of the Ovens' Point; there is otherwise no danger whatever.

Between Lunenburg and Iron-bound Island, at the entrance of Le Have River, the shore is bold and much indented with irregular inlets or bays. *Iron-bound Island* lies about W.S.W. ½ S., distant nearly two leagues from Cross Island; it is inhabited, and some small rocky islets surround its northern shore. S.E. ½ E., 1½ mile, from this island, is a bank of 20 and 25 fathoms; and W.S.W., three-quarters of a mile from that, is a small spot of 15 fathoms: these have from 30 to 40 fathoms around them.*

LE HAVE RIVER is about ¾ of a mile wide, and has a depth of 4 and 3 fathoms, excepting at its entrance, where there is a bar of from 12 to 15 feet water; it can consequently be frequented only by small vessels, and these ought to have a pilot on board. On the south-west side of the entrance are a number of islands.

In approaching Le Have River from the south-eastward, Cape Le Have, on the south-western side of the entrance, will be readily distinguished, as it is an abrupt cliff 107 feet high. At the distance of a mile S.E. by S. from it, is a rock named the Black or Le Have Rock, a danger 10 feet high, and 100 feet long; it is probable that the correct position and particulars of this rock are yet to be ascertained, but it is said to have deep water around it, and 9 to 11 fathoms between it and the shore, except on a small knoll, lying off and opposite to the cape, over which are only 4 fathoms. At 3½ miles, W. by S., from the cape is Indian Island; and several islands lie to the northward of the cape, with passages between them, although the best entrance to the River Le Have is to the northward of them all. There is a good channel to the northward of Iron-bound Island, but it is narrow, and to navigate it you must give the Iron-bound Island a good berth, when you will have from 12 to 4 fathoms water all through; but the best passage is to the westward of the island, as it is wider and has a depth of not less than 10 to 14 fathoms. About 3 miles to the north-westward of Iron-bound Island is a bar, which runs across from shore to shore; over this are 12 and 15 feet, the deepest water being one-third across from the eastern

* On the south side of Iron-bound Island there is a lighthouse 29 feet high, which shows a light flashing every 30″ at 70 feet above the sea, visible 13 miles. The building consists of a square white tower.

shore. The soundings from Iron-bound Island towards the bar are 11, 14, 12, 9, 7, 6, 5, 4, and 3 fathoms, the latter depth being close to the edge of the bar; but when you are well over that, you drop into 4, 5, and 6 fathoms. The river continues navigable 12 miles up, or as far as the falls; and when you are 8 miles up it, you will meet with the road from Lunenburg to Liverpool, where a ferry is established. There are several settlements on the banks of this river: and the whole bear the appearance of gradual prosperity.

Within and to the westward of Cape Le Have is Palmerston Bay; at the head of this is Petite Rivière, a settlement formed by the French, the farms of which are in excellent condition. Off the eastern entrance of this bay is the small island named Indian Island. It is high water, F. and C., at Cape Le Have, at 8h., and the tides rise from 5 to 7 feet.

PORT METWAY, or JACKSON.—The entrance to this bay may be known by a hill on Metway Head, the western side of entrance, and by a long range of low rugged islands on the eastern side. It is seven-eighths of a mile broad, but increases in width as you enter, and has a depth of 10 to 4 fathoms. The land to the eastward of the harbour is remarkably broken and hilly. The South-west Ledge, or outer breaker, on the starboard side, without the entrance, lies S.E. ¼ S., about 1½ mile from Metway Head. The Stone Horse, a rock dry at low water, lies E. by S., one-third of a mile from the South-west breaker. When approaching from the eastward, you will avoid the South-west Ledge, on which the sea breaks in rough weather, by keeping the lighthouse on Coffin's Island open of the land to the eastward of it. The course up the harbour is N. ½ E. and W.N.W.

On Metway Head, the western side of entrance, there is a square lighthouse, coloured white, with a black square to seaward, which exhibits a fixed light at 44 feet above the sea, visible 10 miles.

LIVERPOOL BAY.—This bay, at 6 miles to the westward of Port Metway, has room sufficient for turning to windward, and affords good anchorage for large ships, with an off-shore wind. The deepest water is on the western shore. Western Head, or Bald Head, at the entrance, is bold-to, and is remarkable, having no trees on it; almost close to it are 10 to 14 fathoms. Herring Cove, on the north-east side of the bay, affords good shelter from sea winds, in 3 fathoms, muddy bottom; but it is much exposed to a heavy swell, and has not room for more than two moderate sized vessels. At high water, vessels of 200 and 300 tons may run up over the bar into the harbour; but at low water there are only 10 feet over it. The channel, within, winds with the southern shore, and the settlements of Liverpool upward.

The entrance bears about W. by S., 17½ leagues, from Sambro' Lighthouse, and W.S.W. ¼ W., 5⅓ leagues, from Cape Le Have. Before it lies Coffin Island, which is distinguished by a lighthouse, 58 feet high, having a light, which revolves every 2 minutes, appearing dark one minute, and light one minute: it is 80 feet above the sea, and can be seen about 16 miles in clear weather. The building is octagonal in shape, and painted red and white in horizontal stripes.

The land in the vicinity of Liverpool Harbour is generally rocky and barren, yet the commercial spirit of the people has raised the town to respectability and opulence. The trade is principally with the West Indies. On Fort Point there is a small square lighthouse of white colour, which shows a fixed light at 30 feet above the sea, visible 7 miles.

In Port Metway and Liverpool Bay, it is high water, on the days of full and change of the moon, at 7h. 50m., and the vertical rise of tide is from 5 to 8 feet.

PORT MOUTON, or MATOON, named by Des Barres, Gambier Harbour.—This port is formed by the Island Mouton, which lies on the south side of the entrance, and forms two channels. The channel on the western side of the island is so impeded by islets and shoals as to leave a small passage only for small vessels, and that close to the main. In the eastern passage there is a rocky ridge, named the Portsmouth or Brazil Rocks, which lies about a mile to the eastward of the island; and a shoal also extends from the N.W. end of the island, to the distance of more than a mile. Within Mouton Island, on the W.N.W., are two islands, named the Spectacles, or Saddles. On both sides of the Portsmouth Rocks (which are always above water) is a deep channel, of a sufficient width for ships to turn into the harbour. With a leading wind you may steer up W.N.W. ½ W., until you bring the saddle to bear S.W. ¼ W., and should then haul up about W. by S. to the anchoring ground, where will be found from 12 to 7 fathoms, muddy bottom, in security from all winds.

An islet, named Little Hope Island, is situated at 5 miles, S.S.W. ¼ W., from the south end of Mouton Island. It is 21 feet high, 200 fathoms in length, and is situated at 2¼ miles from the shore; around it is a shoal. This is a very great danger, and should have a beacon to distinguish it.

The next harbour, west of Little Hope Island, is Port Jolie (Stormont River of Des Barres, and Little Port Jolie of others), which, although it extends 5 miles inland, is altogether so shoal as to have scarcely sufficient water for large boats. Between this harbour and Little Hope Island are several ledges, which show themselves, and there is a shoal spot nearly midway between the island and the main.

PORT EBERT, or GREAT PORT JOLIE, may readily be known by the steep and abrupt appearance of its western head; by a small island named Lesser Hope on the east side of the entrance; and also by Green Island, which lies to the south-westward of its entrance. This latter island is somewhat remarkable, being destitute of trees. The only anchorage for large vessels is in the mouth of the harbour; and the channel leading to it is not more than 60 fathoms wide, between Bridge's Rocks and Stony Beach. Above are flats, with narrow winding channels through the mud.

SABLE RIVER lies to the south-westward of Port Ebert, distant 5 miles. At its entrance, nearly midway of the channel, is a rocky islet, which lies S.W. by W. from Green Island, distant 3⅓ miles, and has a passage on either side of it: that to the eastward has 12, 13, and 15 fathoms water, but that to the westward is somewhat shallower. The two points of entrance of the river are distant from each other 1¼ mile, with from 6 to 11 fathoms; but there is a bar, which renders this place totally unfit for affording shelter to any but the smallest class of vessels.

RUGGED ISLAND HARBOUR seems to have been so named from its craggy and rugged appearance, and the numerous dangerous ledges and sunken rocks at its entrance. This place is seldom resorted to, unless by the fishermen, on account of the difficulty of access, although, within, the anchorage is good, in 4½ and 4 fathoms; strangers must, therefore, in all cases, take a pilot. In a gale of wind, the uneven rocky ground at the entrance causes the sea to break from side to side. At a mile from the western head is a bed of rocks, named the Gull, over which the sea always breaks.* Thomas, or Rugged Island, to the east of the harbour, affords a good mark for it, this island having high rocky cliffs on its eastern side; from its southern point sunken rocks extend to the S.W. nearly a mile, and within these is the Tiger, a rock of only 4 feet, lying South, half a mile from Rug Point, the eastern point of the harbour. Having cleared these on the outside, haul up to the N.N.W. for the islands on the left or western side, in such a manner as to avoid a shoal which stretches half-way over from the eastern side. Pursuing this direction, you may proceed to the anchorage in the north arm of the harbour.

To the westward of Rugged Island Harbour is Green Harbour, having an island on the western side of the entrance, and running in fully 3 miles: this and the River Jordan, situated still further to the westward, appear to be places where good anchorages may be obtained, but they are at present little frequented by shipping, although they have many inhabitants. They are open to southerly winds, which cause a heavy rolling sea.

SHELBURNE HARBOUR, or Port Roseway.—Cape Roseway, the S.E. point of Roseneath or Macnutt's Island, is a high cliff of white rocks, the top of which is partly without wood. The west side of the island is low. The lighthouse on the cape is painted black and white in vertical stripes, and exhibits two fixed lights vertically, by which it is distinguished at night from the light of Sambro', or that at Halifax. The upper light is about 100 feet above the level of the sea, and the smaller light is 62 feet. The latitude of this lighthouse is 43° 37′ 31″; longitude, 65° 16′ 30″.

Mr. Backhouse has given the following directions for this harbour:—

"When coming in from the ocean, after you have made the lighthouse, bring it to bear N.W., or N.W. by N., and steer directly for it. The dangers that lie on the east side, going in, are the Rugged Island Rocks, a long ledge that stretches out from the shore 6 or 7 miles, the Bell Rock and the Straptub Rock. On the west side is the Jig Rock. The Bell Rock is always visible, and bold-to.

When you are abreast of the lighthouse, steer up in mid-channel. Roseneath Island

* A lighthouse has recently been erected on the *Gull Rocks*, which shows a fixed light at 51 feet above the sea, visible 10 miles. The building is coloured white, and square in form.

is pretty bold-to all the way from the lighthouse to the N.W. end of the island. When you are half-way between George's Point and Sandy Point, points on the east side of the harbour, be careful of a sunken rock running off from that bight, on which are only 2 and 3 fathoms at low water; keep the west shore on board to avoid it: your depth of water will be from 4, 5, to 6 fathoms.

Sandy Point is moderately steep-to. Run above this point about ½ a mile, and come to anchor in 6 fathoms, muddy bottom. If you choose, you may sail up to the upper part of the harbour, and come to anchor in 5 fathoms, muddy bottom, about 1½ mile from the town, below the harbour flat.

In sailing in from the eastward, be careful to avoid the Rugged Island Rocks, which are under water, and do not haul up for the harbour till the lighthouse bears from you W. by N. ½ N., as by that means you will avoid every danger in approaching.

In sailing into Shelburne from the westward, do not haul up for the lighthouse till it bears from you N.W. by W. ½ W.; you will thus avoid the Jig Rock on the west, which lies within one mile and a quarter S. ¼ W. from the lighthouse, and is pretty steep-to.

Should the wind take you ahead, and constrain you to ply to the windward up the harbour, do not make too bold with the eastern shore; for half-way between George's Point and Sandy Point is a reef of sunken rocks. When you come abreast of them, you need not stand above half-channel over to avoid them: the Hussar frigate, in plying to windward down the harbour, had nearly touched on them. On the west shore, abreast of Sandy Point, it is flat; therefore do not make too bold in standing over.

The ledge of rocks that H.M.S. Adamant struck upon, which lies abreast of Durfey's House, is to be carefully avoided: do not stand any further over to the westward than 4½ fathoms, lest you come bounce upon the rock, as the Adamant did, and lay a whole tide before she floated, and that not without lightening the ship. The east shore has regular soundings, from Sandy Point upward, from 3 to 4 and 5 to 6 fathoms, to the upper part of the harbour, where you may ride safely in 5 fathoms, good holding ground. Your course up from the lighthouse in a fairway, is from N.W. to N.W. by N.; and when you round Sandy Point, the course is thence N. by W. and North, as you have the wind. The entrance of Shelburne Harbour affords a refuge to ships with the wind off-shore, (which the entrance of Halifax does not,) and there is anchoring ground at the mouth of the harbour, when it blows too strong to ply to windward.

In sailing from the westward for Shelburne at night, you must not haul up for the harbour until the light bears N. by W. ½ W., in order to avoid the Jig Rock; and when sailing in from the eastward, you must not haul up for the harbour till the light bears W. by N.½ N., in order to avoid the ledges that lie off the Rugged Islands, and bear from the lighthouse E. ¾ S., eight miles distant. You may stop a tide in the entrance of the harbour, in from 16 to 10 fathoms, sand, and some parts clay bottom.

Shelburne is a safe harbour against any wind, except a violent storm from the S.S.W. At the town, the wind from S. by E. does no harm; although, from S. by W. to S.W. by S., if blowing hard for any considerable time, it is apt to set the small vessels adrift at the wharves; but in the stream, with good cables and anchors, no winds can injure.

Shelburne affords an excellent shelter to vessels in distress, of any kind, as a small supply of cordage and duck can, at almost any time, be had. Carpenters can be procured for repairing; pump, block, and sailmakers also. It affords plenty of spars, and, generally, of provisions. Water is easily obtained, and of excellent quality. The port-charges for a vessel which puts in for supplies only, is, or was, fourpence per ton, light money, on foreign bottoms."

NEGRO HARBOUR lies about 7 miles to the south-westward of Shelburne, and is a good port for vessels unable to enter that harbour, or in cases of distress with a S.E. gale or in expectation of a fog, as access to and egress from it are easy. It is about 7 miles in length, and has a depth of 6, decreasing to 4 and 3 fathoms, which latter depth is at about two-thirds from the entrance. At its entrance there is an island named Cape Negro Island, the eastern end of which is remarkably high and cliffy, and bears the name of Cape Negro; this island is surrounded by a rocky ledge

extending a short distance out, so that in approaching it closely considerable care is required, and particularly near its north-western end, as from that end of the island the ledge extends out about ½ a mile. Cape Negro Island is very low in the middle, and appears at a distance like two islands; by it the entrance to the harbour is formed into two channels, named the North and South Channels.

The North Channel is about half a mile wide, but narrows as you get near the west end of Cape Negro Island. The northern side is formed by the shallow flat filling up the estuary of the Clyde River, the edge of which is steep-to. In it there is a depth of 6 to 3 fathoms. At the entrance there is a dangerous rock of 6 feet water, named the Budget, and a little to the northward of this are some rocks, called the Grays, which are connected to the northern shore by a flat of 7 to 12 feet; in other respects the channel is tolerably free from danger. To run in, keep the Grays Rocks on board, or keep ¼ nearer those rocks than Cape Negro Island, and steer N.W. for Point John, until you can see across the isthmus in the centre of the island, or until Shelburne Lighthouse is shut in; from thence haul to the westward, but do not approach the island nearer than 2 cables' lengths, and when you have opened the small islands at the head of the harbour haul up N.N.W. for the anchorage. At the anchorage the bottom consists of mud and clay, and along the north-eastern side of Cape Negro Island it is of stiff clay.

The South Channel into the harbour is between Cape Negro Island and Blanche Point, and in sailing in, care is necessary not to run on the flat extending out from the shore on the west side of the channel. This flat extends out ⅜ over the channel towards the island, and on it are several rocks frequently visible, particularly the Savage Rocks on the outer edge of the flat, which form a good mark for the passage. This channel can only be recommended in particular cases, such as being in a disabled state and caught in a S.E. gale, as the dangers then show themselves. To run in, give the Savage Rocks a berth of about 3 cables' length, and steer towards Cape Negro until Davis Island, near the head of the harbour, comes open of Point William, then run up in that direction and pass that point ¼ nearer than the north point of Cape Negro Island.

The above directions for Negro Harbour are of course to be followed only in the event of not being able to get a pilot.

PORT LATOUR (Port Haldinand of Des Barres) is separated from Negro Harbour by a narrow peninsula. The extreme points of the entrance are Blanche Point on the east, and Baccaro Point on the west. Between, and within these, are several clusters of rock, which render the harbour fit for small craft only.

Boccaro or Latour Point has a square building on it, painted white with a black ball on the seaward side, which exhibits a fixed light, showing a bright flash of 15″ duration, with alternate eclipses lasting about 25″. The lantern is elevated 49 feet above high water, and the light should be seen in clear weather at the distance of 12 miles. When rounding the point inside the Bantam Rocks, give it a berth of ¾ of a mile, especially on its western side, to avoid the Shot Pouch and other rocks extending from it.

The Bantam Rocks lie 1⅛ mile S.W. from Boccaro Lighthouse, and are very steep-to, there being from 6 to 11 fathoms at less than a cable's length from them all round. They extend north-east and south-west about 2 cable's lengths, and uncover in parts at low water spring tides. Their position may generally be easily determined, as the sea is nearly always seen breaking over them. By giving Baccaro Point a berth of 2 miles, you will pass well outside, between them and the dangerous Brazil Rock.

The Brazil Rock is a small isolated rock of 12 feet, with from 8 to 16 fathoms close-to all round. In bad weather the sea breaks heavily over it, but in fine weather it only shows itself by a tide-rip. It lies 5½ miles S. ½ W. from Boccaro Lighthouse, and 7¾ miles S.E. by E. ¼ E. from Cape Sable. The rock is flat, and covers a space of about 10 yards; a tail extends 90 or 100 yards from its base, having 6 to 8 fathoms water; the tide running strong over this, causes a ripple, and makes the rock appear larger than it really is. Southward of the rock, at the distance of about a mile, you will have 17 and 18 fathoms, then from 20 to 26 as you approach nearer to it; but towards the Cape Sable shore the soundings are regular, from 10 to 18 fathoms; you will then lessen your water to 10 and 7 fathoms, when you will be at the edge of the Race Horse Shoal. To the northward of the Brazil Rock, in the direction of the Ban-

tam Rock, you will have 16, 19, 15, 10, 16, 15, and 10 fathoms; with this latter depth you will be near the Bantam, and must tack to the westward. At the Brazil Rock the tides turn ½ an hour before high and low water at Clam Point, in Barrington Bay. The exact position of the Brazil Rock has been much disputed, but the place recently assigned to it by Com. Shortland, R.N., is latitude 43° 21′ 30″ N., and longitude 65° 26¾′ W.; although M. Des Barres considered it to be in latitude 43° 24′ 15″ N., and longitude 65° 22′ W.

BARRINGTON BAY has its entrance between Boccaro Point and Cape Sable, which bear from each other E. by N. and W. by S., distant 7¼ miles; the bay runs in to the northward for about 9 miles, the greater part of its western side being formed by Cape Sable Island. For the first 4 miles within Boccaro Point, the navigable channel gradually decreases from 4 to ¾ of a mile in breadth, and from 9 and 12 to 3½ fathoms in depth, except on Stony Island Shoal, the centre of which lies 3 miles W. by N. from Boccaro Lighthouse; here there are but 3½ to 5 fathoms water, over a space covering about ⅜ of a mile in extent either way. Thence the channel turns to the north-westward, running in about midway between the two shores, but is limited to ⅛ of a mile in width by the sandy flats extending therefrom, though the depths vary from 3½ to 6 fathoms throughout. From the northern part of this reach, to the pool fronting the town of Barrington at the head of the bay, the channel becomes very limited indeed, its direction being about N.N.E. 1¾ mile, and depth from 5 to 2½ and 2 fathoms. Abreast Barrington the soundings range from 6 to 12 feet, in a pool one mile in length and ⅛ a mile in breadth, so that none but small vessels visit this place, and these, if at all unacquainted, must have the aid of local knowledge, for the flats are steep-to, and the upper part of the channel narrow and intricate.

At Clam Point, on the north-eastern side of Cape Sable Island, high water takes place at 8h. on the days of full and change; springs rise 7 feet, neaps 5½, and neaps range 4 feet. The light on Boccaro Point has been described on page 19.

Vessels from the eastward should round Boccaro Point at a berth of 2 miles or more, but be very careful to avoid the Brazil Rock, before described, and when the lighthouse bears N.E. by E. 2 miles distant, you will be in a depth of 13 or 14 fathoms, and have the Bantam Rocks midway between you and the lighthouse, and should steer N. ½ W. 5 miles, giving either shore a berth of ¾ of a mile, to avoid the shoals extending from them. This course will carry you up to abreast Clam Point, the eastern end of a small island, then haul up N.W. by N. towards the Lighthouse Rock, and continue so for 1¾ mile, and you will be in a depth of 5 or 6 fathoms, where you may anchor. To proceed to Barrington a pilot is requisite. It is said, however, that the channel may generally be discovered by the water appearing dark; even then it will require a leading wind to wind through it, and it is therefore much safer to obtain such aid.

If from the westward, give Cape Sable a berth of 3 miles, and steer towards Boccaro lighthouse, bring it to bear N.E. by E. distant 2 miles, and proceed as before. The eastern side of Cape Sable Island should not be approached nearer than 1¾ or 2 miles till Boccaro lighthouse comes to the southward of E.S.E., because of the numerous rocky ledges detached and extending from the shore.

On the north-western side of Cape Sable Island there is a passage up to the head of Barrington Bay, but the extensive flats adjoining the opposite shores, together with the numerous rocky heads, render the channel so narrow and winding that none but small vessels, with a commanding breeze, and under the guidance of local knowledge, ever run in by it. Directions would, therefore, be useless. Besides which, the tide of ebb is forced unnaturally through to the eastward, by the Bay of Fundy tide, at the rapidity of 3, 4, and sometimes 5 knots an hour.

CAPE SABLE.—Cape Sable is the south-eastern extremity of a small narrow island, which is separated and distinct from Cape Sable Island. The cape is white, broken, evidently diminishing, and may be seen at the distance of 5 leagues. Two rocky ledges extend 1½ mile southward from the cape, upon which the general depths are 3½ to 5 fathoms, but there are three much shallower spots, with only 7, 12, and 15 feet water over them. About 1½ mile westward of the cape, and extending 2 miles southward from Black Head, is another ledge, the outer part of which bears the name of S.W. Ledge, and has on it one or two heads of rock, which become dry 3 or 4 feet at low water of spring tides, and others just awash at that time. These ledges are exceedingly dangerous, particularly as the tides, both flood and ebb, set directly across them at the rate of 3 and sometimes 4 miles an hour, causing a strong break to a con-

siderable distance, particularly when the wind is fresh; it will then often extend fully 3 leagues out, shifting its direction with the tide, the flood carrying it to the westward, and the ebb to the eastward; the former running a considerable time longer than the latter. This rippling, or breaking of the water, may be considered hazardous to pass through in a gale of wind; but there are not less than 14, 16, 18, and 20 fathoms, rocky ground, beyond the distance of 3 miles from the cape. Go no nearer at any time to the cape than this, and you will avoid all the dangers lying off it. It is high water at Cape Sable, on the days of full and change of the moon, at 8h. 30m.; spring-tides rise 9 feet, neaps 7 feet, neaps range 4¼ feet.

Three miles north-westward of Cape Sable lies a small island 20 feet in height, and named Green Island; it is connected with the group of islets to the eastward by a ledge partly uncovered at low tide, and when approaching it from the southward do not bring it to bear northward of N.E. when you are within two miles of it, so as to avoid the rocks between it and the S.W. Ledge. Green Island Bank has 4½ and 5 fathoms, and extends nearly east and west ⅜ of a mile, its centre being ¾ of a mile W. by N. from the island; close-to all round it are 6 and 8 fathoms. At 1½ mile N.E. ¼ N. from Green Island is the entrance of the channel into *Clarke Harbour*, which runs in south-eastward and southward about 1¼ mile between two extensive shoals, to the anchorage in 3 or 3½ fathoms; it is too difficult for a stranger to discover, although it is frequented by the coasters and fishermen.

SHAG HARBOUR.—The entrance to this harbour is 6 miles north-westward of Cape Sable. It then runs in to the northward between Stoddart Island on the eastern and Bon Portage Island on the western side, and is from 6 to 9 fathoms deep in the fairway. The best anchorage is in 5 or 6 fathoms 2¾ miles above Stoddart Island; just before reaching which, however, the channel becomes very narrow by the encroachment of the shoals extending from both shores, and there is, besides, a small rock just awash at low water lying right in mid-channel. This rock may be avoided by bringing the house on the middle of the northern side of Stoddart Island just open eastward of a detached rock off Prospect Point. Hence to Cockerwit the channel is narrow, shallow, and winding, and the very small vessels that go up to that place, do so by the aid of local knowledge.

Here it is high water on full and change days at 9h.; springs rise 11½, neaps 8½, and neaps range 5 feet. The flood runs in northward and the ebb the contrary.

Cockerwit Passage, the southern part of which forms Shag Harbour, is the channel inside the Bon Portage, Mutton, and St. John's Islands, its northern entrance being about 2 miles southward of Pubnico Harbour. It is too shallow in parts to be serviceable to any but small craft, and the masters of these must be acquainted with the navigation to take them thro gh in safety. Least depth, 7 to 9 feet. The western sides of the above islands should have a good berth given them to avoid some shoals and rocks, the outermost of which, named St. John's Ledge, has the sea mostly breaking over it.

PUBNICO HARBOUR is a very good one, easy of access, and well situated for vessels bound to the Bay of Fundy, which, in distress, may here find supplies as well as shelter. From the lighthouse on Seal Island to the entrance of Pubnico, the bearing and distance are N.E. by E. 14¼ miles. The entrance, between St. Ann Point and the eastern shore, is nearly 1 mile wide, and from 6 to 12 fathoms deep. Hence the bay runs in 6½ miles N. by E. ½ E., but is only 1 mile in average breadth, and the greater part of this space is occupied by broad flats uncovering at low water. The channel up to Pubnico is, therefore, narrow and winding, though not under 5 fathoms in depth till within 2¼ miles of the head of the bay. High water takes place on full and change of the moon at 9h. 3m.; springs rise 12½ feet, neaps 10, and neaps range 5½ feet.

On Beach Point, just within the entrance and on the eastern side of the channel, 60 fathoms within low water mark, is a square white lighthouse, 27 feet high, from which a fixed light is shown at the height of 28 feet above high water, visible 8 miles. The red light kept open westward of St. John's Island clears St. John's Ledge, and when making for the harbour in any other direction the light must not be brought to the southward of E.S.E.

Coming from the eastward for Pubnico, beware of the Brazil Rock, give Cape Sable a berth of not less than 3 miles, and steer N.W. by W. 10 miles, then haul up N. by E., 9 miles, till abreast the south end of St. John's Island, making due allowance for the set of the tidal streams, the flood running north-westward and the ebb south-east-

ward, and also taking care not to approach the western side of Bon Portage and Mutton Islands nearer than 1½ or 2 miles, or into less than 12 fathoms water, always keeping Pubnico lighthouse open westward of St. John's Island, and thereby avoid the St. John's Ledge, over which the sea generally breaks. Steer now N.E. ½ E. towards the lighthouse, leave it about a cable's length on your starboard side, and the buoy on the extremity of the rocks, just within the lighthouse, on your port hand; ¾ of a mile N. by E. of this buoy is the best anchorage in from 6 to 10 fathoms, abreast Meres House.

On sailing towards Pubnico, you pass St. John's Island, 2½ miles before you arrive at the entrance of the harbour; the north side of the island affords good shelter during a S.E. gale; small vessels lie along the beach forming its eastern part.

Coming from the southward and westward for Pubnico, remember the positions (pages 23 and 24) of the Blonde and Purdy Rocks, and the Elbow Shoal, off the south end of Seal Island. A berth of 5 miles off the lighthouse will clear all, and you may, when that building bears N.N.W., steer N.E. by N. 13 or 14 miles, which will carry you up to abreast St. John's Island. Then haul up towards Beach Point lighthouse, and proceed as before.

Tusket River, &c.—Between Pubnico Harbour and the Tusket Islands, the southernmost of which (Bald Tusket) bears W. by N. ¾ N. 9½ miles from St. Ann Point, there is an extensive bay with a great number of islands in it, through and among which several rivers form deep, but narrow and winding channels, the principal and also the westernmost being named the Tusket River, having on its right bank, 6½ miles within the entrance, the Plymouth Settlement, nearly all the way up to which a depth of 3½ and 5 fathoms can be maintained. In the different reaches of this river good anchorage may be had, but to go up to either will require the aid of a skilful pilot. Unless bound to one of these rivers, this bay should be avoided, for there are two or three outlying dangers, the St. Ann Shoal, Gull Ledge, and S.W. Shoal, &c., which might prove fatal to a stranger. Beach Point lighthouse kept northward of E.S.E. leads outside all.

THE TUSKETS, OR TUSKET ISLES, consist of a group lying off the extremity of the peninsula forming the western side of Tusket River, and 9½ miles westward of Pubnico Harbour. Some of them are of considerable size, and there are many shoals and ledges among them, so that, although there are navigable channels between, no stranger ought to attempt to pass through them. The southernmost, named Bald Tusket, is 50 feet high, and surrounded by a flat of from 6 to 12 feet. Southward and detached from this island and one another by deep water of from 10 to 17 fathoms, are three shallow spots, all of which may be distinguished by the tide rippling over them. The outermost and shallowest (12 feet), named *Cleopatra Shoal*, lies 1¾ mile S. by E. from the island.

Between Cleopatra Shoal and Soldier Ledge there is a channel 2 miles wide and from 5 to 9 fathoms deep. The tide, however, occasions a heavy ripple, which might prove dangerous to small and deeply laden vessels. In the fairway the currents run, near the middle of each tide, about 2½ knots an hour, the flood in a north-west and the ebb in a south-east direction, or nearly that of the channel, and turn about 40 minutes after high and low water at Pubnico. To pass through this channel, southward of Cleopatra Shoal, from the entrance of Pubnico steer W. by N., and you will, if this course be made good, pass out well to the northward of Soldier's Ledge and Jacko Ridge.

Soldier's Ledge.—The centre of this dangerous ledge bears S.W. by S. ¾ S. 3¾ miles from Bald Tusket, and N.N.W. 2⅓ miles from Flat Island, the north-westernmost of the Mud Islands. Its extent is about ⅓ a mile in a north and south direction, and breadth about ¼ of a mile. The shallowest or middle portion uncovers 2 hours after high water, and the sea may generally be seen breaking over it, but on the other parts there are from 1½ to 2½ fathoms. A flat of 3½ and 4 fathoms extends fully a mile further southward, and ¾ of a mile further northward from the ledge; thence nearly all the way towards the Western Tuskets the tides produce a heavy rippling.

Between Soldier Ledge and the Mud Islands the channel is 1⅓ mile wide, and from 4½ to 6 fathoms deep, but as the tides set athwart its direction, care should be taken to avoid being driven on the former, or upon the ledges among the latter, over both of which they set with considerable strength.

THE MUD ISLES, sometimes called the North Seals, are a group of islets occupy-

ing a space of 3½ miles in extent from north to south, and 1½ mile in breadth. Commencing with the northernmost, they are named Flat, Round, Mud, and Noddy. Round Island, the highest of the cluster, attains an elevation of 25 feet, and is covered with wood, as is also Mud Island, the largest and central of the group. Among them are several passages with 2 and 3 fathoms in them, serviceable to coasters, and on their western side, ¾ of a mile off Mud Island, lies the Black Ledge, which covers only at high water of spring tides, and has many shoal patches in its vicinity, the outermost, named Mud Island Shoal, having 4 fathoms over it, and distinguishable by a breaking sea in very heavy weather; it lies 2½ miles N.W. by.W. ½ W. from Noddy, the southernmost of the Mud Islands. The eastern side of these islands may be approached to within ½ a mile, and if requiring to anchor, moderate protection from a westerly wind may be had in 6 or 8 fathoms at that distance off the middle of Mud Island. With a south-easterly wind there is anchorage off the north-west side of Flat Island in 4½ to 6 fathoms.

Between the southernmost Mud Island and Seal Island there is a channel 2¼ miles wide, and from 8 to 18 fathoms deep, except on a shoal running a short mile southward from Noddy Island, over which are 5, 6, and 7 fathoms, and always a strong rippling of the tide. The flood sets N.W. and the ebb S.E. in this channel, with a velocity near the middle of each tide of nearly 4 miles per hour. When sailing through it keep on the Seal Island side, on account of the above-mentioned overfalls.

The course and distance to pass from Cape Sable to between Seal Island and the Mud Islands is N.W. by W.; several spots may be found in this track, of from 9 to 7 fathoms, bottom of gravel, upon which the sea breaks violently in spring tides. The north end of Seal Island is tolerably bold-to; there being within ¼ of a mile of it from 5 to 7 fathoms.

SEAL ISLAND.—In approaching the Bay of Fundy from the southward or south-eastward, the most conspicuous object, and that to which the shipmaster's attention ought to be directed, is Seal Island, as it is the outermost island off this coast of Nova Scotia, and is readily distinguished in the night-time by its excellent light. Its southern extremity bears from Cape Sable about W.N.W. ½ W., distant 17 miles. The island is a little more than 2 miles in length from north to south, and ½ a mile in average breadth, and its southern part, covered with scrubby trees, is elevated 30 feet above the sea.

The lighthouse on the south point of Seal Island is of an octagonal shape, built of wood, and painted white; it shows a conspicuous fixed light at 98 feet above high water mark, which may be seen, on approaching, from every point of the compass, to the distance of about 18 miles. The building must not be approached by strangers nearer than at least 5 miles while it bears between W.N.W., northerly, and E.N.E., and then with great care, in order to avoid the various dangers in the vicinity of the island. The position of the lighthouse is lat. 43° 23′ 34″ N., and long. 66° 0′ 52″ W.

Off the middle of a curve in the eastern shore vessels may anchor in 5½ or 7 fathoms, when the wind is from the westward, and in Crowell Cove, on the western side, in 4½ fathoms when it blows from the eastward. It is safest to enter this latter anchorage from the northward, passing in between the north end of the island and Limb's Limb Ledge, as a shallow spit runs westward from the middle of the island almost all the way over towards that ledge, upon which there are but 12 and 13 feet water. High water on the days of full and change in the cove at 9h. 2m.; springs rise 12¾ feet. On the eastern side of the island the tide makes to the northward at half ebb and runs till high water, when it turns again to the southward, and off the southern side the current of ebb begins 50 minutes after high water at Crowell Cove, and sets S.E. by S., with an average velocity of 2¼ miles an hour, over the Elbow and Zetland Shoals, and the Blonde Rock. The flood runs in almost the contrary direction.

Limb's Limb and Devil's Limb are two ledges of rocks lying about a mile off the western shore of Seal Island; the former, showing itself one hour after high water, bears N.W. by N. ¼ N. 1⅛ mile from the lighthouse, and is separated from the 12-feet spit which extends ⅛ a mile westward from Crowell's Chimney and forms the south side of Crowell Cove, by a very narrow channel of 3¼ and 4½ fathoms deep; and the latter, which is ⅛ a mile southward of Limb's Limb, and about 8 feet above high water, has another shoal 2 cables southward of it, bearing the name of Loch Foyne, and uncovering at low water of springs only. Both these rocks are steep-to on their western

side, and should, therefore, be cautiously approached. There is a good channel between Devil's Limb and Loch Foyne Shoal and Seal Island from the southward up to the southern edge of the 12-feet spit, and the smoothest anchorage is said to be in about mid-channel, where will be found 3½ or 4 fathoms, clear sand.

The Elbow and Zetland Shoals lie off the south end of Seal Island. The Elbow Shoal causes a violent rippling, and is separated from the rocks extending from the island by a channel ⅓ a mile wide, and 6 to 8 fathoms deep, in which the tide also produces a heavy rippling. Hence it extends above a mile southward, and is ⅓ a mile broad, the soundings over it in general ranging from 3 to 5 fathoms, but there are three or four places with only 15 feet over them, and one near the middle of even much less water; this is named Elbow Rock, and bears S. by W. ¼ W. 1⅜ mile from the lighthouse. Zetland Shoal is westward of the Elbow, and was discovered in November, 1848, by the ship Zetland, when it was reported to have but 18 feet over it, but a subsequent examination by Com. Shortland, R.N., shows it to have not less than 21 feet on its south-west extremity, and 10 and 12 fathoms close-to. To the north-eastward of it the soundings are 4¼, 7, 4½, 6, 8, and 5 fathoms as you proceed towards the island in the direction of the lighthouse, which bears from the shoalest (21 feet) spot nearly N.E. 1⅞ mile.

Blonde Rock.—At the distance of 3⅓ miles S. ⅓ E. from the lighthouse is situated the Blonde, a small and very dangerous rock, which generally breaks, is two feet above the water at low spring tides, and on which the frigate of that name was lost in 1777. Close round the rock are 7, 9, and 10 fathoms water. The Blonde is particularly dangerous, as the ebb-tide sets strongly towards it; and from the lowness of Seal Island, you may be on it before you are aware, even in fine weather. About a mile to the westward of the Blonde are very heavy and dangerous overfalls, which present a very alarming appearance, but not less than 9 fathoms have been found in and around them.

The Purdy Rock has 13 or 14 feet over it, is small, breaks in heavy weather, and is surrounded close-to by deep water of 8 to 14 fathoms; it bears from Seal Island lighthouse S.E. by E. ⅓ E. distant 2¼ miles, and from the Blonde Rock N.E. by N. 2¾ miles. When making for the anchorage under the east side of Seal Island, or for the channel between that island and the Mud Isles, its position should be carefully guarded against.

Therefore, as before observed, strangers, in large vessels particularly, should avoid getting entangled among or thrown upon any of these dangers, by giving Seal Island lighthouse a berth of at least 5 miles, while it bears between W.N.W., northerly, and E.N.E.

Pollock Rip, a small shoal spot of 6 fathoms, is said to lie about 11¾ miles S.W. by W. ½ W. from the lighthouse on Seal Island, and W. by S. 10 miles from the Blonde Rock.

Dangers westward of Mud and Tusket Islands.—Besides Mud Island Shoal and Soldier Ledge, before described, there are several shoals and rocks above and under water, situated between 3 and 6 miles off the western side of Mud and Tusket Islands, and, commencing with the southernmost, are named Jacko Ridge, Gannet South Shoal, Gannet S.W. Shoal, Gannet Dry Ledge, S.E. Rock, South Rock, Gannet Rock, North Rock, and Green Island.

The *Jacko Ridge* consists of two shallow patches, separated by a depth of 7 fathoms, the northern and shoalest (4½ fathoms) portion lies 6¼ miles N.W. by W. from Flat Island, the north-westernmost of the Mud Isles. This ridge generally shows a long tide ripple, extending north and south, and is said to break in a heavy sea.

Gannet South Shoal is 2 miles north-eastward of Jacko Ridge, with 10 and 16 fathoms between, and 4⅝ miles W. ⅓ S. from the southernmost or Bald Tusket; it has 4 fathoms over it, is small and steep-to, and causes a ripple, and sometimes breakers in a very heavy sea.

Gannet S.W. Shoal is narrow, has 3 and 3½ fathoms on each end and 4 near its middle, and extends north and south ⅓ of a mile. It shows a small ripple, breaks in heavy weather, and has immediately off it 5 to 10 fathoms. From its centre Bald Tusket bears E. ¾ S. 6 miles, and Gannet South Shoal S.E. nearly 2 miles.

Gannet Dry Ledge or Opossum's Ledge, some very dangerous and steep rocks ¼ of a mile in extent, which uncover about 2 hours ebb and generally break, lie 1⅓ mile further northward, with Bald Tusket E.S.E., southerly, 6¼ miles, and Gannet Rock N.E. ¾ E.

1¾ mile distant. This is the westernmost of these dangers, and may be passed in safety on a clear night by keeping Yarmouth lighthouse to the eastward of N.N.E. ½ E.

S.E. Rock breaks in a heavy sea, and has 16 feet water over it, or even less, and from 5 to 10 fathoms all round; it lies 1¾ mile eastward of Gannet Dry Ledge, and 1¼ mile S. by E. ½ E. from Gannet Rock. About midway, but a little westward of the direct line between it and Gannet Rock, is the *South Rock*, which shows itself above the water at half-tide.

Gannet Rock is small but high, about 50 feet above the sea at high water, and whitened with the dung of birds. It lies 2¾ miles S.S.W. from Green Island, and 3¾ miles W.N.W. of Spectacle Island, the westernmost of the Tuskets; in passing through the channel between these latter islands and the rock, bear in mind the position of the S.E. Rock, and give the southwest side of the Tuskets a berth of 1½ mile or more to avoid the Spectacle, Harriet, and other ledges lying off them. One-fourth of a mile northward of Gannet Rock is the *North Rock*, which shows itself at half-tide.

Green Island has shallow water all round it, which on the south side extends off ½ a mile. It is small, about 50 feet high, and bears from Jebogue Point S.W. ¾ S. 2¾ miles. When passing Green Island, observe, therefore, that the reef from the island runs to the southward ½ a mile, and has off it from 6 to 5 fathoms water, and that between it and the Gannet Rock are from 12 to 17 fathoms, except about midway, where there is a small spot with only 4½ fathoms over it.

The shore of the mainland to the eastward is studded with a number of small islands, which have channels in and among them leading to the different settlements on the banks of the various inlets, and several dangerous shoals outside, so that a good berth should at all times be given them, and the aid of a pilot obtained if bound to any place hereabout, or requiring to take shelter under their lee.

JEBOGUE RIVER is 18½ miles northward of Seal Island, and has its entrance between Jebogue Point on the western, and Reef Island on the eastern side, but before it are three dangerous shoals, which divide the entrance into two principal channels, and when within these, the water soon shoalens to 7 and 9 feet in the passage round the eastern side of the Fox and Beal Islands, and to 12 and 15 feet in that on their western side. It soon deepens again, but the channels become very narrow, and when abreast the northern part of these islands on either side, anchorage may be had in from 12 to 18 feet, about a mile within the river. The channels here unite and run to the northward between broad mud flats extending from both shores, which make it very narrow and winding.

It is high water on the days of full and change at 9h. 47m.; springs rise 16½, neaps 11, and neaps range 6½ feet.

Reef Shoal, distinguished by a tide rip, has 12 and 13 feet over it, is steep-to, and lies 1⅓ mile S. ½ E. from Jebogue Point, and W.S.W. ⅞ of a mile from Reef Island. The best channel, named the Inner Channel, is to the westward of it, and you may clear it on this side by keeping Yarmouth light open westward of the west tangent of Jebogue Point. Keep upon this bearing till about ½ a mile from the point, then haul up to the eastward for either passage, according to circumstances.

Jebogue Ledge, sometimes named the Dragon, also makes a rippling of the tide and breaks with an ordinary swell at low water; upon it are 14 and 16 feet, and one spot near the centre nearly awash; it lies one mile S.W. ½ W. from the extremity of Jebogue Point, and 2 miles W. by N. of Reef Island. Inside this is the Jebogue Point Shoal, upon which are 13 and 15 feet. The two divide the Inner from the Northern or Outer Channel. To clear their northern side bring the Earthy Cliff of Fox Island open southward of Jebogue Point, E.N.E. ¾ E., and it will lead up to the point, which should be rounded to the eastward at the distance of 3 cables' lengths. A pilot is necessary for a stranger.

The Roaring Bull and Foul Ground.—These are two dangers off the north-western side of Jebogue Point. The Foul Ground, over which there is a rippling of the tide, has 9 feet least water over it, and is ½ a mile in extent north-west and south-east. Between it and the nearest shore, from which it is ¾ of a mile distant, there are from 4 to 10 fathoms. From its centre Yarmouth lighthouse bears N. ½ E. 3 miles. The Roaring Bull, or Bagshot Rock, is 3 feet above the sea at low water of spring tides, is steep-to on all sides, and very small; it lies above a mile off shore, and when on it, Yarmouth light bears N. by E. 2½ miles. Between it and the Foul Ground are 4 and

5 fathoms. There are three or four spots of 4¼ and 4¾ fathoms between Jebogue Point and Yarmouth, but all within 1½ mile of the land.

YARMOUTH.—Although situated on the extreme western shore of Nova Scotia, Yarmouth is a place rapidly rising in importance. Yarmouth Sound runs in north-eastward, between Cape Fourchu and the main land. When within, good shelter can be had from all winds, but the channel, though not less than 15 or 18 feet deep all the way up to the town, is narrow and winding, and in one or two places its free use is impeded by rocks and shoals; hence to a stranger the aid of a pilot is very necessary. About half way in on the eastern side is Bunker Island, joined to the main by a low beach; inside this island is what is usually called Yarmouth Harbour. The wharves of the town extend from the shore across the flats to the edge of the channel, and vessels lie off them in 2, 3, and 5 fathoms. High water takes place here on the days of full and change at 10h. 6m.; springs rise 16¾, neaps 12½, and neaps range 8¼ feet.

Cape Fourchu, or the Forked Cape, is very remarkable, being rocky, barren, and high, and is so named from the island, which forms it, having two narrow prongs running out to the southward. The cape bears from Jebogue Head N. by W., distant 4⅓ miles. Just within the extremity of the East Cape or Prong, and on the western side of the harbour's entrance, there is a lighthouse, which exhibits a brilliant revolving light, at 117 feet above the level of the sea, visible for 1¼ minute, and invisible ½ a minute, to the distance of 20 miles. The building is painted red and white, in vertical stripes; is 58 feet high, and stands in lat. 43° 47½′ N., and long. 66° 9′ 25″ W. In fine weather you may approach the light to within ½ a mile, and anchorage may be obtained to the eastward of it, and also to the westward during fine weather, but caution is requisite. We believe a fog bell is struck seven times in each minute during thick weather.

The inlet formed by the two prongs of Fourchu Island must not be mistaken for the entrance to Yarmouth, which lies to the eastward of them both.

From the eastward, bound to Yarmouth, pass well to the southward and westward of Seal Island, and steer so as to leave Jacko Ridge, Gannet S.W. Shoal, and Gannet Dry Ledge at a good berth on the starboard side, and you will thus leave Gannet Rock and Green Island at least 2 miles to the eastward. When in sight of Yarmouth light-house do not bring it to bear northward of N.N.E., to avoid the Foul Ground and Roaring Bull. If overtaken hereabout by thick and foggy weather it would perhaps be advisable to stand off and on into not less than 20 fathoms, rather than close with the shore, at the same time being careful not to get to the northward of the parallel of the lighthouse, for fear of grounding upon the dangerous Lurcher Shoal. When you are within 1½ mile of the lighthouse, steer for it, pass it at the distance of ½ a mile, and haul round to the eastward into Yarmouth Sound, keeping in mid-channel, and, if necessary, you may anchor in 3½ or 4 fathoms with the lighthouse bearing W. by N. ½ N. distant about 3 cables, or proceed further in, but as the channel becomes confined and intricate, a pilot is indispensable to a stranger going into the harbour. On the east side of the entrance are some rocks which cover at ⅓ flood, named the Hen and Chickens; the spire of the church in line with the middle of the low beach between Bunker Island and the main just clears their outer edge. The country around is very fertile, and a good coasting trade is carried on with Halifax, Annapolis, and St. John's. Several fine vessels have been lately built here, and everything encourages the expectation that before many years elapse the town of Yarmouth will be one of the most prosperous in Nova Scotia.

The Lurcher consists of two patches, named the S.W. and N.E. Shoals. The S.W. Shoal covers an extent of about 2 cables in length north and south and one cable in breadth, upon which are from 9 to 18 feet, but there is a prolongation eastward and westward for a short distance whereon are 4 and 5 fathoms; all round almost close-to are 8, 10, and 13 fathoms, and a little farther off, on all sides except the northern, from 20 to 30 fathoms, while between it and Cape Fourchu are 28, 38, and 14 fathoms. It lies 14¼ miles N.W. by W. ¾ W. from Cape Fourchu, in lat. 43° 50′ 12″ N. and long. 66° 29⅓′ W. The N.E. Shoal is a very small patch of 5 fathoms with 12 and 14 around it, lying N.E. 2⅕ miles from the S.W. Shoal, being separated therefrom by soundings of 8, 11, and 17 fathoms. The flood sets northward and the ebb southward over this shoal, both producing a heavy tide rip, and at neaps running with a velocity of 2½ knots per hour.

Trinity Ledge lies about 6 miles off the shore between Capes Fourchu and St. Mary, and bears from the latter S.W. by W. 6½ miles. It extends E.N.E. and W.S.W. ½ a

mile, and is ¼ of a mile broad. Near the centre are three rocky heads showing themselves at low water, the highest then being 3½ feet above the sea, and other parts some which become awash at low tide. The sea breaks over in heavy weather, and off its north-eastern side there is always a heavy rippling sea. Immediately around the ledge are 6, 7, and 9 fathoms, and from 20 to 30 fathoms 1¾ mile westward. The flood runs to the northward and the ebb the contrary, at the rate of about 2½ miles an hour.

From Cape Fourchu to Cape St. Mary the coast trends N. by E. ½ E. 17½ miles, and should not be approached nearer than a mile. The tides near it follow its direction, running at the rate of 1½ mile an hour, the flood northward and the ebb southward. The coast has a level and woody appearance, with a few red earthy banks, and in the vicinity of Cape St. Mary the land has a gradual rise till it attains the height of 300 feet about 5 miles in shore.

DIRECTIONS.—Vessels coming round Cape Sable, and intending to take the passages northward of Seal Island, should give the cape a berth of 3 miles or more, and proceed through either of the channels already described, whichever may suit their convenience, but such a course will require the aid of skill and resolution, and if to these be added a local knowledge, then time and distance can be saved and safety ensured. From the above-mentioned berth off Cape Sable to the passage between Tusket Islands and Soldier's Ledge (page 22) the course and distance are N.W. by N. 18 miles, which, if made good, will carry you nearly 2 miles eastward and northward of Round Island. This direction may be continued so as to pass out between Gannet Rock and Green Island, leaving Cleopatra, Spectacle, and other ledges off the south-western side of the Tuskets, ⅔ of a mile off on the starboard side, and the S.E. and Gannet Rocks a similar distance on the port hand. If bound into Yarmouth you may now follow the directions given on page 26, but if bound for the Bay of Fundy or St. Mary's Bay, pass either outside the Lurcher Shoal by steering first N.W. ½ W. 22 miles, and afterwards N. by E. ½ E. 30 miles to the entrance of the bay of Fundy; or between the Lurcher and Trinity Ledges by following a N. by W. ½ W. course 24 miles, then haul up N.E. into St. Mary's Bay, or steer N. ½ E. 20 miles further for that of Fundy; or inside the Trinity Ledge by sailing along shore and keeping at from 1½ to 5 miles therefrom up to Cape St. Mary, the southern point of entrance of St. Mary's Bay. Which of these courses is to be taken depends on the force and direction of the wind, but in either case make due allowance for the set of the tides, and remember that both flood and ebb run very strongly over the Lurcher and Trinity Ledges, the former to the northward and the ebb the contrary.

From the before-mentioned berth off Cape Sable towards the channel between the north side of Seal Island and the Mud Isles (page 23), steer N.W. by W. 15 miles, and pass through it on a N.W. course, keeping nearer Seal Island than Noddy, to avoid the overfalls off the latter. This N.W. course may be continued for 30 or 35 miles, till well out to seaward, leaving Mud Island Shoal and Jacko Ridge from ½ to 1½ mile to the northward of you, after which a N. by E. ½ E. direction will carry you towards the Bay of Fundy, outside the Lurcher. Or, if intending to go inside the Gannet Rocks, and out to the southward of Green Island, and having continued on the N.W. course till Seal Island Lighthouse bears S. by E., steer N. ½ E. 11 miles, or till abreast Gannet Rock, sailing between Mud Island Shoal and Soldier and Spectacle Ledges to the eastward, and Jacko Ridge, Gannet South Shoal, and S.E. Rock to the westward. Now haul out north-westward, give Gannet Rock a berth of ½ a mile on the port hand, and proceed as directed in the previous paragraph.

For a stranger, however, it is advisable to keep well outside to the southward of Seal Island, say at about 35 miles, passing at the distance of 20 miles to the westward of it; thus the Bay of Fundy will be open, and the course up first N.N.W., till on the parallel of Cape Fourchu Light, and then N.N.E. for the entrance of the bay. This will carry you outside the Lurcher, but the tide will make a difference in these courses, as it sets in a south-easterly and north-westerly direction, and near the Manan Ledges the ebb runs W.S.W. and the flood E.N.E., at the rate of 4 knots an hour, which must be allowed for.

From Seal Island up to Cape St. Mary the land is level and well wooded, and the soundings, under 60 fathoms, extend fully 25 and 30 miles off the land, westward of Bryer's Island. Near the Manan Ledges are 60, 80, and 100 fathoms at 3 and 4 miles' distance, therefore the lead should always be kept going.

If a chart of the S.W. coast of Nova Scotia be examined, and the relative situation of that coast, as exposed to the Atlantic Ocean, with the consequent and variable set of the tides about it, as well as about the Manan Islands, &c., be considered, the mariner will be naturally led to consider that its navigation, involved in occasional difficulties, requires very great attention; and the supposition is justified in consequence of the great number of ships lost hereabout; yet there are few obstacles which a moderate exercise of skill and resolution would not have been able to overcome, and it is to be feared that the absence of these qualifications occasioned such losses to a greater extent than the actual dangers of the navigation.

"In order," says Mr. Lockwood, "to lessen these accidents, if not totally to prevent such fatal occurrences in future, let the mariner be fully convinced of the necessity of frequently sounding with the deep-sea lead, and see the expediency of having his anchors and cables fit for immediate use; this cannot be too strongly impressed upon his mind, for vessels well equipped and perfect in gear, with their anchors stowed as in the middle of the Atlantic Ocean, have been here wrecked in moderate weather, and so frequently, that such gross neglect cannot be too much reprobated; such serious losses will, we trust, be hereafter prevented, more especially as it is so dependent upon the mariner himself, and may be, in most cases, remedied by only sounding in time, and keeping the lead in continual action."

If from Europe, and bound to the Bay of Fundy, endeavour to keep in about 43° or 43° 5′ N., and having obtained soundings on the western part of Sable Island Bank, keep the deep-sea lead going as you proceed to the westward, sounding progressively on the Le Have and Cape Sable Banks; the former may be known by the hard rocky bottom, and the latter by being generally black gravel. These precautions become more necessary, as a fair wind is frequently accompanied by a thick fog, often for several days together.

In thick weather, by a careful attention to the soundings as you approach towards Cape Sable, and keeping your vessel under commanding canvas for getting soundings, you may round the cape with safety in 35 or 40 fathoms: the soundings will inform you when off the cape, being small black stones, sand, and gravel. When across this bank you will fall into deep water in the bay, and may shape a course for the American shore, and should endeavour to make the land about Moose Peake Head, or Machias. Mount Desert and the Skuttock Hills may be seen at a great distance; sometimes they may be seen clearly from the mast-head over the fog.

SABLE ISLAND AND BANKS OFF NOVA SCOTIA.

SABLE ISLAND.—The east end of this remarkable island is situated in lat. 43° 59′ 5″ N. and long. 59° 48′ 27″ W., according to the determination of Captain Bayfield, R.N., who surveyed it in 1851. The island is almost entirely composed of white sand, of a coarser nature than the soundings about it, but nevertheless sufficiently fine to be easily moved by the winds, which have a considerable effect in altering the features of the land, large sand hills being rapidly formed, and again in a short time removed. There are but a few large stones on the island, such as there are being probably the ballast of wrecked vessels, and there is an entire absence of anything deserving the name of soil, so that no cultivation whatever can be carried on, the sole production of the island being two kinds of grasses, wild peas, strawberries, and cranberries, of which latter the quantity is so great and the quality so fine, that they have been proposed as an article of export. There are no trees, and fuel is obtained from the drift wood, mostly the product of wrecks. Fresh water is easily obtained by digging a few feet in the sand. The cattle are principally wild horses, besides the domestic animals belonging to the establishment; there are also great numbers of rabbits.

Sable Island is about 18 miles long, and 1¼ mile broad in its middle, but tapers at each end to a narrow point, particularly at its eastern end. The direction of the island is about E. by S. ½ S., and in the greater part of its interior there is a salt lake of 5 to 12 feet water. The climate is said to be healthy, and those who have resided here for a number of years speak of it in terms of high praise, notwithstanding the frequent fogs and consequent humidity of the atmosphere; it appears to be greatly influenced by the proximity of the island to the Gulf Stream, which is distant from it

only about 70 miles to the southward. Winds from the southward almost immediately dissolve the snow which may have previously fallen, causing, with the alternating northerly winds, a wider range and yet a higher mean temperature than occurs on the neighbouring continent during the winter months. The southerly winds coming thus from a warm to a comparatively cold sea, are compelled to part with a portion of their moisture, and hence are almost always accompanied with a dense fog. These winds greatly prevail during the summer months, those from the south-west especially; on the contrary, winds from between North and East prevail mostly during the spring and early summer, and are usually attended with fine weather. In autumn and winter the easterly winds bring bad weather, and are accompanied by a falling barometer.

When approaching Sable Island from the northward, it appears at the distance of 10 miles to consist of a long range of sand-hills, some of which are very white. From the southward the range of white sand appears more continuous, and very low towards the west end of the island. On a nearer approach many of these sand-hills are seen to be denuded by the waves, so as to form steep cliffs towards the sea; in other parts they are covered with grass and defended by a broad beach, which, however, cannot be reached without passing over ridges of sand, covered with only a few feet of water, and parallel to the shore, at distances not exceeding $\frac{1}{3}$ of a mile; these form heavy breakers, dangerous to pass in boats when any sea is running. The landing is in general impracticable on the south side, excepting after several days of northerly wind. On the north side boats can land only in southerly winds, and after some continuance of fine weather; but there are surf-boats at the establishment which can land dry when an ordinary boat would be instantly swamped.

The sand-hills at the eastern portion of the island average 60 and 70 feet in height. One of these sand-hills, named the East Hill, at about a mile from the East Point, is considered an eligible position for a lighthouse, should one ever be established.

The principal establishment on the island (1851) is situated on the north side, between the pond and the sand-hills, and consists of a house for the superintendent and his family, and of various other buildings. Opposite the establishment is the west flagstaff, which is strongly and substantially erected on a sand-hill 40 feet high, and at its summit is a *crow's-nest*, or look-out, 100 feet above the sea; from this look-out it is in contemplation to show a small light occasionally. To the eastward of this flagstaff about 7 miles is the middle flagstaff, standing on a hill near the east end of the salt lake; but this will probably be soon removed to a more advantageous position on the south side of the island, where there is a house, and where it will be better situated to report wrecks, as well as to render prompt assistance. The east flagstaff is on a sand-hill on the north shore of the island at about $2\frac{1}{4}$ miles from its east point. Besides the houses at the flagstaffs there is an unoccupied one on the north side, which was distant in August, 1851, about 320 fathoms from the west extreme of the grassy sand-hills. These various flagstaff stations are extremely useful, as no wreck can take place on the island at a greater distance than 6 miles from one of them, and signal is at once made of such a melancholy occurrence to the superintendent at the principal establishment.

Anchorage.—Off the north side of the island, excepting near the east end where the deep water approaches too near the land, the anchorage is good between the depths of 5 and 10 fathoms, and at the distance of 2 and 1 miles from the shore. The bottom is of fine sand holding well, but the sea is so heavy, excepting with off-shore winds, that a vessel should weigh instantly on the first appearance of a wind from sea. Great caution is necessary in approaching from the northward at night or in thick weather, because the east end of the island and the north-east bar are very steep on that side, although the soundings afford sufficient warning further to the westward.

The south side of the island may be safely approached by the lead, excepting near the bars, where it becomes shallow and dangerous, but it is advisable to have the advantage of a commanding breeze, on account of the strong and uncertain tides and currents. Vessels seldom anchor off this side of the island, because of the prevailing southerly swell, and the consequent difficulty of landing.

The Bars.—At each end of the island are dangerous bars, upon which the sea breaks in bad weather. These bars are extremely difficult to avoid when at a short distance from the north side of the island, and caught with a strong northerly wind, and if to this we add the suddenness of the dense fogs prevalent at some seasons of the year in

the vicinity of the island, a vessel under such circumstances is placed in great peril, and nothing but the most careful navigation is able to extricate it. Their state, as represented by Captain Bayfield in 1851, is as follows:—

"The North-west Bar is dry to ¾ of a mile out from the end of the grassy sand-hills, but it has several patches of sand nearly dry, about a mile further out, and which are supposed to have collected around the remains of old wrecks.

The North-east Bar is dry four miles out from the grassy sand-hills; the sea washing over the outer half of that distance only in rough weather. At the distance of 1¾ mile out on this bar a sand-hill, about 10 feet high, and with some grass on it, has accumulated around the wreck of a vessel lost there in the year 1820.

If we add the dry parts of the bars to the length of the island, the whole extent of sand dry at present, will be 22 miles; and if again we add to this distance the still greater length of the bars under water at either end, the whole will form a bow or crescent concave to the north, and extending over 52 miles of sea. Caught within the horns of this crescent in a strong northerly gale, the situation of a vessel would be extremely perilous; for the ebb-tide sets to the southward, directly on and over the bars, usually at the rate of 1½ or 2 knots, and when accelerated by winds much faster; whilst the flood-stream runs at a much less rate in the opposite direction.

The whole extent of the North-west Bar, from the end of the grassy sand-hills to the depth of 10 fathoms, is nearly 17 miles; the dry part being succeeded by 9 miles of foaming breakers in bad weather, and the remaining 7 miles, from 5 to 10 fathoms of depth, being usually shown by a great ripple, or a heavy cross sea. The direction of this bar is N.W. ½ N. (magnetic) for the first 12 miles, then W. by N. for the remaining distance; beyond which the water deepens gradually to the westward for many miles.

The North-east Bar extends 14 miles out from the grassy sand-hills to the depth of 10 fathoms. Its direction is N.E. by E. ½ E. for the first 7 miles, beyond which it curves gradually till it terminates to E.S.E.

The dry part of nearly 4 miles is succeeded by 8 or 9 miles of breakers when there is any sea running. I have considered this bar as ending at the depth of 10 fathoms, but the ridge of sand continues, with a depth of from 10 to 13 fathoms, and often a heavy breaking sea, 10 miles further to E.S.E., and then ends abruptly; the soundings increasing to 170 fathoms, in a distance of 3 miles further in the same direction. Both bars are extremely steep, and consequently dangerous of approach on the north side; the North-east Bar especially so, having 30 fathoms of water close to it. To the southward, on the contrary, the water deepens gradually out for so many miles, that it would seem almost impossible for any vessel, using common precaution, to run on shore on that side either of the island or its bars. Yet by far the greater number of shipwrecks have taken place there, affording a sad proof of the culpable neglect of the sounding lead, so common in the mercantile marine. Some of these vessels came on shore in fine, although foggy weather, after running for many miles in shallow water, when one cast of the lead would have shown them their danger, and in many cases saved both life and property.

In most cases the vessels were thought to be far to the eastward of the island, when they ran on shore upon it, having been set to the westward by the currents. That this alleged cause is the true one, there seems little reason to doubt, for the general tendency of the currents, between Newfoundland and Sable Island, is to the westward, although they are greatly modified by the various banks over and between which they flow; and are also rendered inconstant and irregular, both in strength and direction, by winds present and at a distance. These currents are, first, the great northern current along the east coast of Newfoundland, which is deflected to the westward by the Great Bank, and secondly, the current out of the Gulf of St. Lawrence composed not only of the stream of the River St. Lawrence, but also of the branch of the northern current which is so generally found entering the Gulf through the Strait of Belleisle.

I have already mentioned the set of the tidal streams over the bars; they too are doubtless much influenced by winds. It was difficult, on account of the surf, to ascertain the exact time of high water on the full and change days, but it was at 7½ hours nearly, and the rise not exceeding four feet. This was on the north side of the island. I am inclined to think that it is high water somewhat earlier on the south side, as has been alleged, and that portions of the flood tide wave, after passing round the bars,

converge and meet on the north side, making high water there perhaps an hour or more later; but I am not aware that any precise or sufficient observations have ever been made to ascertain this. It is said by the people of the island, that all floating things which have been lost overboard anywhere in the vicinity of the island, are sure to be found on it sooner or later. This would lead us to suppose a prevailing circular motion in the currents or tidal streams, to which the arrangement of the island, its bars, and the middle ground to the north of it, in their peculiar shape, may in whole or in part be due."

In case of shipwreck, it is of course greater hazard to life to be wrecked on the bars than on the island, and as it is important to know on which bar the vessel is, and the consequent direction in which to seek for safety on the island, you may ascertain this, should the island be obscured by fog or the darkness of night, by observing the direction of the breakers, those on the N.E. bar extending between N.E. by E. and E. until near its outer extremity; whilst those on the N.W. bar extend N.W. $\frac{1}{2}$ N.

Fogs, &c.—Captain Bayfield, R.N., says:—"Some of the heaviest gales in these seas have been from the N.E. and East quarters, and they are usually followed, almost immediately after the barometer has reached its lowest point of depression, by an equally strong gale, from between the North and West, and which is always accompanied by clear weather and a rising barometer. Easterly as well as southerly winds are foggy. The latter become less predominant as the summer advances, when westerly winds and clear weather become proportionately of less rare occurrence.

It is the fogs, even more than the irregular tides and currents, that render this island so dangerous; they frequently last many days and nights in succession with the prevalent easterly and southerly winds of early summer; and even as late as the beginning of August, when we were about the island, only 6 days out of 19 were entirely free from fogs. Winds between North and West are, in general, frequent in autumn and winter; they almost always bring fine clear weather, with a rising barometer, but are often of great strength, and in winter accompanied with intense frost."

It is high water at Sable Island on the days of full and change of the moon at 7h. 30m. Ordinary spring-tides rise 7 feet, and neap-tides 4 feet. The flood sets in from the S.S.W. at the rate of $\frac{1}{2}$ a mile an hour: but it alters its course, and increases its velocity, near the ends of the island. At half-flood it streams north, and south at half-ebb, with great swiftness, across the North-east and North-west Bars; it is, therefore, dangerous to approach them without a commanding breeze.

ADDITIONAL DESCRIPTIONS.—The foregoing describes Sable Island as it existed in 1851; we add the following by Mr. Darby, the late superintendent of the island, written in 1829, because it affords many interesting particulars not included in it. We remark, generally, that the island has frequently been partially destroyed by the sea washing over it, and great changes in its configuration have from time to time resulted from these inundations—therefore, no reliance ought to be placed on the state of the bars for any length of time.

"The soundings about Sable Island decline regularly only on the south side; but approaching the isle from any other bearing whatever there is comparatively deep water (10 fathoms and more) close to danger. In foggy weather, vessels should not approach the north side or point of either bar nearer than 25 fathoms.

Two belts encircle the isle, the outer—a mile from the shore—$2\frac{1}{2}$ fathoms. These belts are increased by gales, and by high winds raking the island, which drift the sand from them to the bars. The isle is composed of loose, light sand, and high gales frequently alter its outline and appearance.

When a vessel is on shore in a fog it becomes of the utmost importance to ascertain her true position, in order to save the ship or the crew; therefore, lower a boat, and observe that if the breakers extend in a N.W. and S.E. direction, you are on the N.W. bar. If the breakers extend W.S.W. and E.N.E., you are on the N.E. bar; and if they are seen to the northward, ahead, and extending from east to west, you are on the south side of the island; but should they be seen to the southward, ahead, and extending from east to west, you are on the north side of the island.

The prevailing winds are from East to South, and from South to West, when the north or leeward side of the island is comparatively smooth, and, therefore, should be sought. There is a swashway in each bar to save lives: get to leeward by crossing either bar (according to the wind) at these places. No risk in moderate weather, but if the surf should appear too dangerous, land as you can, or try to weather the bar

altogether. Having once gained north of the bar, haul up S.E. or W.S.W. (as the case may be) for the land; and take the boat ashore, as near the house as may be convenient. The semi-circular form of the north side is favourable for boats, as under a windward curve a lee is afforded from east and west winds; but with fresh north winds this form is against a boat getting off the land. Therefore, if ashore on the north side, push the boat right before the sea for the land, rather than risk getting to leeward by crossing either bar; but if ashore on the south edge of either bar, wind north, land on the south side.

If ashore on the north-east bar in tolerable weather, wind about west, you may land at the east end without crossing the bar, and (*vice versâ*) if on the north-west bar, and owing to the inner belt, high water is best landing.

After landing, if owing to fog you cannot judge your situation, so as to shape your course to one of the houses, seek the lake, and then proceed.

Strong gales cause annual shiftings of the sand on both bars, which in the course of years must alter their form and extent. I have given the form of the bars as found in 1823. Mariners approaching the isle are warned to keep the lead going, and never to go nearer on the south side than 10 fathoms, or the north side than 25 fathoms.

North-west Bar extends 16 miles, and is 2 miles wide; the land bears S.E. from its point. The tide on this bar sets north, slacks at half-flood, and turns south before high water; its rate is two knots. The bank, to the west, and this bar are travelling to north-east.

The soundings are particularly irregular to the N.W. and N.N.W., with very variable currents. The whole of this bar breaks in bad weather.

North-east Bar extends 28 miles and is 2 miles wide, the land bearing W.S.W.

The flood-tide sets N.N.E. 5 knots, the ebb 3 knots or less, and is scarcely felt with a spell of south and south-west winds. In gales of wind the whole bar will be one line of breakers, but in more moderate weather they do not extend beyond 18 miles, and a vessel may cross at 24 miles in 7 fathoms. The bar is travelling north.

South side of the Island.—The current on this side, in shoal water, with prevailing south and south-west winds, sets rapidly eastward until it reaches the end of the north-east bar; it then joins the St. Lawrence stream, which passes the bar in a S.S.W. direction, and runs strongest in April, May, and June. I have sufficient reason to believe that the Gulf Stream, in 42° 30′ N., running E.N.E., occasions the St. Lawrence stream, running S.S.W., to glide to westward. The strength of this stream has never been noticed, and three-fourths of the vessels lost have imagined themselves to the eastward of the island, when in fact they were in the longitude of it."

A subsequent description of the island in 1837, by the same gentleman (Mr. Darby), speaks of it in the following terms. In alluding to the tides, he says:—"Easterly, southerly, and S.S.W. winds, set a rapid current along shore in shoal-water, to the W.N.W. and N.W.; that is, along the shore of the western end of the island, but not the eastern or middle, as there the current, with southerly and S.W. winds, sets to the eastward. The natural tendency of the flood-tide is toward the coast. When it strikes the island it flows to the eastward, over the north-east bank, and to the westward over the north-west bank, and passes the west end in a north-west direction so rapidly that it carries the sand with it; and the hills of the west end being high and narrow, they are undermined at their base by it, and tumble down some thousands of tons of sand at a time. This the current beneath catches, and sweeps away to the N.W., increasing the bank. As soon as this current passes the extreme point of the dry bar, it tends more across the bank to the N.E.; the motion of the sea contributing to keep the sand in motion; the current carries it to the N.E. and spreads to the N.W. Although across the bank from the island, to the distance of 15 or 20 miles to the N.W., there is a flood and ebb tide, the flood setting to the N.N.E., the ebb to the S.S.W., the flood comes over a broad flat bottom until it arrives at the highest ridge of the bar, bringing the sand with it so far. It then finds deep water suddenly to the eastward of the bar, and its strength is as suddenly lost, the waters pitching over this bank, settle gently in deep water, and the sand going with the current does the same, and keeps the eastern edge of the bar and the bank very steep; but to the southward and westward it is flat and shallow.

The ebb tide, setting gently to the southward and westward, meets the steep side of the bank; and rising above it, passes over and increases in strength, merely levelling

the sand that had been brought up by the last flood. It does not carry it back until the next flood comes, which brings up a fresh supply from the washing of the island; and so alternately the sand changes with every flood and ebb tide. The consequence is, that although the west end is several miles to the eastward of where it was in 1811; yet the shoalest or eastern part of the bar or bank has the same bearing from the dry land that it had then, which plainly shows that the bar and bank have increased eastward as fast as the island has decreased in the same direction. But the distance of the outer breakers has not increased more than about 2 miles; in 1829 their whole distance from the land being from 10 to 14 miles, in rough weather bearing N.W. from the island. There is a passage across the bar inside, about 4 or 5 miles broad, with 3 or 4 fathoms of water. Since 1811, or about 26 years, an extent of $4\frac{1}{2}$ miles of high land has been washed away, which averages rather better than one-sixth of a mile every year. In the last few years it is nearer to $\frac{1}{4}$ of a mile every year, owing to the land being much narrower than it was the first 15 years of the elapsed time. The whole of the island that does not wash away grows in height; the most windy seasons cause the greatest elevation of parts where loose sands can be blown on to them; but the island in general grows narrower.

The eastern end of the island has not wasted much in length since my knowledge of it,—nearly 30 years. The high land (about a mile of it) has blown down with the wind, (but not washed down with the sea, as at the west end,) and now there is a low, bare, sandy beach, extending in a N.E. direction from the high land about 3 miles. I think about one mile of this was high land, or sand-hills, 30 years ago; the other 2 miles were formed by a low sandy beach, as at present: the elevated portion of the one mile of course has been blown into the sea, and gone to increase the shoal water on the bar, being carried there by a strong flood-tide setting to the N.N.E. The bar itself extends from the dry part E.N.E., and at the distance of 12 or 14 miles from the high land, a very shoal spot, always breaks, except when dry, at which time seals may be observed lying on it. Between this spot and the land is a passage about 5 or 6 miles wide, with from 3 to 4 fathoms of water in it. This bar and bank is also very steep on the north-western edge, and shallow and flat on the opposite directions. The bar travels to the northward slowly; the N.W. bar travels to the northward and eastward rapidly. The variation of the compass, by amplitudes, on the 9th February, 1837, was 20° 22′ W., and I think increasing."

Mr. Darby writes on another occasion, "The most of the wrecks that happen here are in consequence of an error in longitude; for instance, vessels bound to the eastward think themselves past the island when they get on shore upon it, and vessels bound from the westward (say from Europe) do not think themselves so far to the westward when they get on shore upon it. I have known several cases of vessels from Europe that have not made an error in their longitude exceeding half a degree, until they came to the Banks of Newfoundland, and from thence, in moderate weather and light winds, have made errors of from 60 to 100 miles, which, I think, goes far to prove the existence of a westerly and southerly current between the Great Newfoundland Bank and here; and also of the existence of a westerly current between the Sable Bank and Gulf of Mexico stream, which will be stronger or weaker according to the distance between the stream and the banks.

When a casualty has occurred, and you find you are on the body of the island, I would recommend that nothing of masts or rigging be cut away, unless the vessel is very tender, and then you may do it to ease her a little; but a vessel of ordinary strength will bear her spars until she heaves upon the beach, or settles in the sand, and lies quiet. Lives and property have often been saved by a vessel having her spars standing, as from them you may often send a line ashore, when it is not possible to work a boat; and by sending a good hawser after that, and securing it well to the shore, a chair, or other more efficient article, may be rigged for conveying passengers, or valuable property, over the breakers in safety. From the nature of the soft sandy bottom, a vessel will not go to pieces so soon as if she was on the rocks; and, by the rigging being left standing, it may afterwards be saved; whereas, if the masts are cut away, the whole of the rigging goes with them, and all get tangled and buried in the sand, and are generally totally lost.

If you are on either of the Bars, the first consideration should be to secure the boats, and lighten the ship, and leave her as soon as ever you have to abandon the hopes of getting her off; an endeavour should be made to get to the leeward of the breakers, and land on the island, according to circumstances. Endeavour to land on the north

side, if possible, as vessels that get on to the bars very soon disappear altogether, either by going to pieces in the irregular sea and strong currents, or by rolling over the steep bank to the northward, and sinking in deep water.

When property can be saved on the island, it is the duty of the master and his crew to do the utmost in their power to save it; they can get the assistance of the people on the island and a boat and a team of horses, not for hire, for they are employed by government, and the island draws a salvage of whatever may be saved on it, which is apportioned by the magistrates at Halifax. The more there is saved by the master and crew, the less salvage will be taken; but it is very often the case, the crews will not assist to save property; and whatever is saved is done exclusively by the establishment, in which case the salvage is pretty high. There are buildings on the island for the shelter of persons cast away on it, with provisions for those who may have none; also some buildings for the reception of perishable goods: these buildings, and whatever is put into them, are under the charge of the superintendent. All property saved must be sent to Halifax by the first opportunity. The master can keep inventories, and continue with the goods if he likes, but has no control over their destination; but, I believe, by petitioning the Governor of Halifax, he might get permission to take them where he pleases, by paying the duty and salvage.

When any property is saved on the island, it is sent to Halifax, where it is advertised and sold by order of the Commissioners, and the proceeds paid into their hands, out of which they pay the Royal Dues, the salvage apportioned by the magistrates, the expenses of freight, and other small charges; and the residue is paid over to the master, or other authorized agent, for the benefit of the underwriters, and all concerned. The superintendent is under the control of the Governor and the Commissioners, and can take no new step without orders from them. The above and beforementioned custom is an old and long-established rule, and supported by many acts of provincial legislature, and more particularly by an act passed the 4th day of April, 1836, which does more fully explain and set forth the rules for the guidance of the establishment.

The north side of the island is very safe, and a vessel may approach any part of it within a mile; and vessels in distress might, by standing in on the north side, and near the west end, where the principal establishment is, get a supply of fresh water or fuel, or a partial supply of provisions and fresh meat, except in cases of a strong breeze and heavy sea on shore. There is no difficulty in working boats on this side of the island. The south side is also very safe to approach in clear weather; but from the heavy sea that constantly breaks on it, the communication with a vessel, by boats, is extremely difficult, except after a spell of northerly winds for 3 or 4 days, when the sea becomes smooth, and boats may work."

THE BANKS.—The NOVA SCOTIA BANKS extend nearly 70 leagues in a westerly direction. From Sable Island they are from 20 to 25 leagues wide, and their inner edges are from 14 to 18 leagues off shore; they are intersected by narrow, winding channels (the bottoms of which are mud), running N.W. and S.E. Between these banks and the shore are several small inner banks, with deep water and muddy bottom. The water deepens regularly from Sable Island to the distance of 22 leagues, in 50 fathoms, fine gravel; thence proceeding westward, the gravel becomes coarser; continuing westward to the western extremity of the banks, the soundings are rocky; and shoalen to 18 and 15 fathoms water.

BANK QUERO or BANQUEREAU.—The south-west end of Banquereau lies about 23 miles N.N.E. ¼ E. from the west end of Sable Island; thence it extends to the eastward as far as long. 56° 35′ W., where it is separated from the St. Pierre Bank by a narrow gully of deep water. This bank is about 60 miles across in its widest part, which is near the middle, and has soundings over it of 30 to 40 fathoms, but near its eastern extremity it has been represented to have very much less water, there having been found at 5 leagues from this end only 16 to 18 fathoms, slimy sand and clams. In long. 59° W., and lat. 44° 43′ N., there is said to be a shoal spot of 15 fathoms, with soundings around it deepening from 25 to 40 fathoms, but these shoal spots rest upon very indifferent authority, and until a survey is made of the bank their existence must be considered as doubtful. Captain R. Owen, R.N., in 1832, ran across this bank in lat. 44° 35′ N., and found the depth to be from 30 to 37 fathoms, with irregular soundings on a bottom of sand, stones and shells, with sea-eggs. The soundings on the north side of the bank are deep close to its edge, as you immediately fall into 90 or 100 fathoms, and also immediately off the southern edge

are 120 fathoms. When sailing along the south edge of the bank caution is necessary, in hazy weather, that you do not miss the gully separating it from the Sable Island Bank, as you may thus get on the bars extending from that island before you are aware that you are off the bank.

MIZEN BANK.—Off the northern edge of Banquereau and between the longitudes of 58° and 59° W. and latitudes 45° and 46° N. is the Mizen Bank, which may be considered to be a part of Banquereau. It is about 25 miles in extent, and has 26 to 40 fathoms on it, with deep water all round.

GENERAL REMARKS.—It may be observed, generally, that the soundings all along the Nova Scotia coast, between Cape Canso on the E.N.E. and Cape Sable to the W.S.W., are very irregular, from 25 to 40 and 50 fathoms; therefore, in foggy weather, do not stand nearer in-shore than 35 fathoms, lest you fall upon some of the ledges. By no means make too bold with the shore in such weather, unless you are sure of the part of the coast you are on; for you may, otherwise, when bound for Halifax, fall unexpectedly into Mahone Bay, or on the coast in its vicinity, and thus be caught and endangered by a S.E. wind.

The weather on the coast of Nova Scotia is frequently foggy in the spring and some part of the summer, in particular at the distance of 4 or 5 leagues from the shores: but on approaching nearer, the weather is found more clear, and, with the wind from the land, it is perfectly clear and pleasant.

At the entrance of the harbours and rivers on the coast, salmon is taken from April till August; and from one to two or three leagues out to sea, cod, halibut, haddock, rays, and mackerel. Herrings are taken in the bays and harbours in the months of June and July, and tam-cod all the year round.

ICE.—On Sable Island Bank it is not an unusual thing to met with ice. H.M.S. Express fell in with two ice-islands of the estimated heights of 180 and 150 feet, on the 7th of July, 1836, when in soundings of 45 fathoms water. The latitude observed was 43° 13′ N.; the temperature of the air 46°, and of the water 42°.

THE BAY OF FUNDY, AND THE COASTS BETWEEN CAPE ST. MARY AND PASSAMAQUODDY BAY.

"It is essential," says Mr. Lockwood, "to the safety of those navigating the Bay of Fundy, that it should be clearly understood; and in cases of necessity, many are the places of safety to which vessels might resort, even without the advantage of a pilot; although no man would attempt to justify the economy of saving the expense of pilotage on a coast like this, where currents, fogs, and changes of weather may confound the best judgment."

ST. MARY'S BAY is the space included between Cape St. Mary and the mainland, and Bryer's Island, Long Island, and Digby Neck, the narrow peninsula running towards Annapolis. It runs in north-eastward and eastward about 30 miles, is 10 miles wide at its entrance and 4 at its head, and has a depth of from 20 and 30 fathoms, decreasing towards the inner part of the bay to 6 and 5 fathoms. When running for the Bay of Fundy it is necessary to be exceedingly careful that you are not carried into this bay, as, should you get far up, considerable inconvenience will be occasioned, besides much loss of time; the proper passage, it will be remembered, is always to the westward and northward of Bryer's Island.

The southern shore of St. Mary's Bay, from Cape St. Mary upwards, is moderately high, in parts thickly wooded, and bordered with sandy flats which run out in some places as much as ¾ and 1½ mile; while the opposite, or northern shore, is constituted of high cliffs, having deep water close under them. About 8 miles before arriving at the head of the bay, and just above the entrance of Sissibou River, is the western end of an extensive sand and rocky bank, which occupies the greater portion of its breadth, leaving only a narrow though deep channel on each side, one close along under the cliffs of the northern shore, and the other at from ½ to 1½ mile from off the southern. Near the middle of this shoal there is a small spot of only 4 feet, rocky bottom, but with this exception the soundings upon it range from 1½ to 2½ and 3½ fathoms. Above the shoal the depths are 5, 4, 3, 2, and 1½ fathoms, the latter being found on the broad mud flat which occupies the head of the bay.

At the entrance of St. Mary's Bay high water on the days of full and change takes

place at about 10¼h., and at its head at 10h. 40m. The tides follow the direction of the shores with a velocity of ¾ or 1 knot an hour, except in the neighbourhood of the Grand and Petit Passages, where it is so much greater, that it is necessary, with the flood, when abreast and near their entrances, to guard against being carried through them.

WEYMOUTH.—The River Sissibou, upon the right bank of which the village of Weymouth is situated, empties itself into St. Mary's Bay, on the southern side, 18 miles within Bryer's Island, and 8½ miles E. by N. from Petit Passage, south entrance. At the mouth of the river there is a hard bar, which partly dries at low water, spring-tides; but at high water there are 14 or 15 feet on it, and sometimes 1 or 2 feet more. Ships of 300 tons occasionally go here to load timber and deals, as there are or were two saw-mills, one near the entrance, the other about 2 miles up the river. At low water the channel of the river is very narrow, so that it is necessary to moor head and stern; but there is sufficient water for a vessel to load afloat at that period. It is said that in the summer time a vessel may, after loading to about 14 feet inside, take a part of her cargo in without the bar, where there is good riding, in 6 or 7 fathoms.

Both sides of the River Sissibou are well settled, and there are several good farms. At Weymouth, about a mile inside the bar, there is an English Church with its parsonage-house. On the west side of the river stands the village of New Edinburgh.

On the days of full and change it is high water at 10¾h.; springs rise 22, neaps 17, and neaps range 12 feet. When sailing towards this place do not approach the southern shore of the bay nearer than 1½ mile, or into less than 9 fathoms.

On the north side of the bay, and nearly opposite to Sissibou River, is a little inlet named Sandy Cove, where small vessels, when it blows hard, may run aground on a bottom of soft mud, and lie sheltered from all winds.

BRYER'S ISLAND, on the north-west side of the entrance to St. Mary's Bay, is 3¾ miles in length, from north-east to south-west, and 1¼ mile broad. Its shores have deep water at less than ¼ of a mile off, except on the south-west side, but the approach to the island should be carefully made, on account of the S.W., Beatson, N.W. Ledges, &c., hereafter described. A lighthouse of an octagonal shape, painted white and 55 feet high, stands on the western side of the island, and exhibits a brilliant fixed light, at 66 feet above the sea, visible 15 miles between the bearings of S. by W. ½ W. westerly and northerly, to N.E. by E. Here the tides are very strong, rendering great care necessary when sailing in this vicinity. Pilots can usually be obtained. The position of the lighthouse is 44° 14′ 57″ N., and long. 66° 23′ 40″ W.

Gull Rock and Ledge are on the south-west side of Bryer's Island. The ledge extends 1½ mile S.W. ¼ S. from the south point of Pond Cove, partly shows itself at one-third ebb, and is terminated by a small rock, named Gull Rock, which is 6 feet above high water: its breadth does not exceed ¼ of a mile, but it is very steep-to, particularly on the southern side, where 16, 24, and 30 fathoms are found at a short distance off.

Bryer's S.W. Ledge lies 1⅞ mile W.S.W. ¼ S. from Gull Rock, with that rock just open northward of Dartmouth Point, the eastern point of the southern entrance of Grand Passage. It is small, has only 12 feet over it, makes a heavy tide-rip, and there are from 7 to 10 fathoms all round. From it Bryer's Island lighthouse bears nearly N.E. by N., not quite 4 miles distant. South-westward of it and between it and the Gull Rock the tides create a strong rippling, but the depths range from 6 to 10 and 20 fathoms. The flood runs N.W. by N. and the ebb S.E. by S. directly over this danger, on which account great caution should be exercised in navigating hereabout.

Beatson and N.W. Ledges, &c., lie 3 miles off the north side of Bryer's Island, with deep water between and around them. Beatson Ledge is the westernmost, has but 12 feet over its shallowest parts, and bears from the lighthouse N. ¼ W. 3¾ miles. The N.W. ledge is likewise small, and has upon it a rocky head whereon are only 6 feet, so that it is exceedingly dangerous; it is distant 4¼ miles N. by E. from the lighthouse, and vessels may pass between it and Beatson Ledge by keeping Gull Rock in line with the extreme western point of Bryer's Island, and to the eastward of it by bringing Maurilyan's Mark (a large granite boulder on the eastern side of Grand Passage) in one with the North Point of Bryer's Island. South-eastward of the N.W. Ledge are some shallow patches of 5½ and 6 fathoms, named the Frenchman's Elbow, with the exception of which the soundings between these dangers and Bryer's Island are from 10 to 40 fathoms. Over all of them the flood sets to the northward and the ebb the contrary, with a velocity of about 4 knots an hour, and creating a heavy tide-rip.

When standing to the northward, vessels should not go so near to the Nova Scotia shore as to shut in Bryer's Island light, for then they will be in danger of running upon some of the ledges about the Gull Rock. In advancing from the westward towards the island, the tide ripples strongly, even in 33 and 45 fathoms, when you are at the distance of 8 or 10 miles off the island.

GRAND PASSAGE AND WESTPORT.—Grand Passage, the channel separating Bryer's from Long Island, is 2 miles long, but the deep water channel is under $\frac{1}{4}$ of a mile in width where narrowest, though not less than 5 fathoms deep. The flood and ebb set through it at the rate of from 5 to 6 miles an hour, the former to the northward and the latter to the southward, besides which, right in the middle of the channel, $\frac{3}{8}$ of a mile off the northern side of Peter's Island, there is a dangerous shallow patch named Passage Shoal, and on the eastern side of the northern entrance the Cow Ledge and Shoal, so that it requires the aid of a pilot to pass through in safety, if at all unacquainted. The village of Westport is on the western side of the passage, off the southern end of which, between it and the Passage Shoal, is the best anchorage, in from 7 to 9 fathoms. High water on the days of full and change at 10h. 47m.; springs rise 21½ feet, neaps 16, and neaps range 10 feet.

Peter's Island is nearly in the middle of the southern entrance of the Grand Passage, and has on its eastern side a light beacon showing two white lights, horizontally, at an elevation of 40 feet, which is intended as a guide to vessels entering the harbour or running through Grand Passage. It stands in lat. 44° 15′ 30″ N., and long. 66° 20′ 20″ W., and will be seen on the approach from seaward and St. Mary's Bay, until shut in by the south side of Bryer's Island and Dartmouth Point, on Long Island side, namely between N.E. by E., northerly, and N.N.W ¼ W., and on the north side (coming out of the Bay of Fundy) between S. by W. and S.S.W. When in the passage, or fairway through, the light will be seen all round, and can be passed on either side; but the eastern passage is the deepest and widest, and most recommended.

The southern entrance of Grand Passage is 11 miles N. by W. from Cape St. Mary. In running for it, from abreast of Cape St. Mary, you will have no impediment whatever, there being a depth of from 14 to 30 fathoms, and at the entrance of the passage as much as 18 fathoms in mid-channel. Pass round the eastern side of Peter's Island, keeping rather nearer that island than the eastern shore, and if intending to anchor off Westport, haul up W.N.W. for it, giving the north side of Peter's Island a berth of 2 but not more than 3 cables' lengths, to avoid the Passage Shoal. Or, if going through the passage, when abreast the lights of Peter's Island, steer N. ½ E. towards the northern end of Bryer's Island, leaving Passage Shoal on your port hand, and when the Bay of Fundy is fairly open, proceed out on a N. by E. ½ E. course, with Peter's lighthouse the apparent breadth of the island open westward of Sand Point, the west extreme of Long Island, which will carry you clear of Cow Ledge and Shoal out into the bay.

Long Island, separated from Bryer's Island by the Grand Passage, and from Digby Neck by the Petit Passage, extends N.E. ½ E. and S.W. ½ W. 10½ miles, and has nearly a uniform breadth of 1¼ mile throughout. Its shores are straight with deep water close-to. On the northern side the flood runs north-eastward and the ebb southwestward at the rate of from 2 to 2½ knots an hour. The island is thickly covered with wood, with partial clearings, and in parts attains an altitude of 214 and 226 feet.

PETIT PASSAGE, between the east end of Long Island and Digby Neck, is 2 miles long N.N.E. and S.S.W. and 280 fathoms wide in its narrowest part, the depth of water being from 6 to 23 fathoms. The flood runs through it to the northward and the ebb the contrary, at the rate of 7 knots an hour. Nearly ¼ of a mile north-eastward of Boar's Head, the western point of the northern entrance, there is a small detached shoal of 7 feet water, with 16 and 18 fathoms immediately off its outer edge; this must be guarded against by keeping nearer the eastern than the western shore when going into or coming out of the passage by this entrance. In sailing through keep near the middle of the channel. On the western side, nearer the northern entrance than the southern, lies Eddy Cove, a convenient place for vessels to anchor in out of the stream of the tide, which runs so rapidly that, without a fresh leading wind, no ship can stem it.

Digby Neck, the name given to a peculiar projection of the land from the main of Nova Scotia, is a peninsula about 17 miles in length N.E. by E. ½ E. and S.W. by W. ½ W., and 1½ mile in breadth. From Petit Passage to Gulliver Hole the distance is 18 miles; the intervening coast is straight and bold-to, except at Sandy Cove, where a narrow shoal projects ½ a mile north-eastward with from 1 to 4 fathoms over it. The

tides follow the direction of the shore, running with a velocity of about 2 knots an hour. The whole of the coast from Grand Passage to the Gut of Annapolis is bound with high rocky cliffs, above which is a range of hills that rise to a considerable height; their tops appear smooth and unbroken, except near Grand Passage, Petit Passage, Sandy Cove, and Gulliver's Hole, where those hills sink in valleys, and near the Gut, where they terminate by an abrupt and steep declivity.

Gulliver's Hole is 7½ miles westward of the Gut of Annapolis, and affords temporary anchorage for small vessels in settled weather in from 5 to 8 fathoms. From Gulliver's Hole across Digby Neck to the head of St. Mary's Bay the distance is 2 miles.

ANNAPOLIS OR DIGBY GUT.—This is the entrance to Annapolis Basin. Its length is 2⅔, and breadth where narrowest ½ a mile, and depth from 12 to 24 and 30 fathoms. The shore, on both sides, without the Gut, is iron-bound for several leagues. The stream of ebb and flood sets through it at the rate of 5 knots, and causes several whirlpools and eddies. The truest tide is on the eastern shore, which is so bold-to, that a ship might almost rub her bowsprit against the cliffs, and be in 10 fathoms water. A shoal runs off Point Prim, the western point of entrance, about 30 fathoms. Just inside and a short distance off the western shore there is a small isolated rock above water, named the Man-of-War Rock, and ⅓ of a mile further in, on the same side, another shoal projecting about the same distance into the channel. It is better, therefore, to keep nearer the eastern side of the Gut than the western. High water on the days of full and change at 11h. 2m.: the range of tides varies from 16½ to 28 feet. In the offing the tide turns in-shore a little before and off-shore a little after high and low water respectively.

On Point Prim, a lighthouse, of a square shape, exhibits a fixed light at 76 feet above the sea, visible about 13 miles. The building is of wood, painted red and white vertically.

Mr. Lockwood says, "That the abrupt precipices of the high lands which form the Gut, cause those gusts of winds which rush down so suddenly and so violently from the mountains. The tide also hurries your vessel through with great force. At the entrance there is no anchorage, except close in-shore, near the outer western point."

Annapolis Basin, in the south-western corner of which is the town of Digby, is a large bay receiving the waters of several rivers, the chief of which is Annapolis River, which runs parallel to the Bay of Fundy for a very considerable distance, being separated from it only by a narrow tract of hilly land, not more than 8 miles wide. On its banks are the towns, named Laurencetown, Bridgetown, and Annapolis, the last of which is 10½ miles within and to the eastward of the Gut, but to go up to it strangers should obtain the assistance of a pilot, for, although there are not less than 18 feet at low tide in the fairway, there are, besides the banks running off the shores and surrounding Goat Island, several detached patches of 3, 6, 9, and 10 feet that might pick up a vessel whose master is not acquainted with their position. The southern part of Annapolis Basin is occupied by a broad and shallow flat, but there is anchorage in 6 or 8 fathoms between it and the western shore, in proceeding to which from the Gut, keep along by the western shore at the distance of ¼ or ⅓ of a mile off it, and bring-to about ¾ of a mile before you come to the town of Digby.

Marshall Cove.—From Annapolis Gut to Marshall Cove the distance is 26 miles, the intervening coast having but one slight curvature, namely St. Croix Bay, in which temporary anchorage may be had in 4 or 5 fathoms in settled weather; the bay is 2 miles westward of Marshall Cove, and with this exception the land is bold-to, with a few rocky cliffs near the Gut, and many banks of red earth under high lands, which appear very even. At Marshall Cove or Port Williams there is a breakwater for the accommodation of a few small craft, and also a white square beacon showing a fixed light, which at the distance of about 5 miles appears of a bright colour, but on a nearer approach it changes to green.

Margaretville is about 11 miles eastward of Marshall Cove, and 38 from Digby or Point Prim lighthouse, the intervening coast being similar to the foregoing. Here there is also a small breakwater, and a light shown from a white square beacon, which at the distance of 5 miles appears as a bright light, but on a nearer approach as a red one.

Black Rock Point, considerably to the eastward of Margaretville, may be distinguished by a lighthouse of a square form, painted white, situate on the southern shore of the Mines Channel, which exhibits a fixed light visible about 12 miles. The lighthouse stands in lat. 45° 10′ 48″ N., at about three-quarters of a mile westward of

Kennedy's Breakwater, and 2½ miles eastward of Giran's Breakwater. Small vessels resort to both these places, and the light will therefore be a useful guide to vessels bound to them, as well as to Spencer Island anchorage, or into the Basin of Mines. The light is elevated 45 feet above the level of high water. Spring-tides rise and fall here about 50 feet.

BASIN OF MINES.—In the channel leading into the Basin of Mines, from Cape Split to Cape Blowmedown, and from Cape D'Or, on the north side, to Partridge Island 18 miles beyond it, the land rises almost perpendicularly from the shore to a very great height. Between Cape Blowmedown and Partridge Island there is a great depth of water; and the stream of the current, even at the time of neap-tides, does not run less than 5 or 6 knots.

Off Cape Split there are whirlpools, very dangerous with spring-tides, which run at about 9 knots an hour. Having passed this place, you may anchor in a bay on the north shore, named Eden Cove, situated between Partridge Isle to the east, and Cape Sharp on the west. Hence, if bound to Windsor River, it will be necessary to get under weigh two hours before low water, in order to get into the stream of the Windsor tide on the southern shore: otherwise, without a commanding breeze, a vessel would run the hazard of being carried up with the Cobequid or eastern tide, which is the main stream, and runs very strongly both ebb and flood; while the Windsor tide turns off round Cape Blowmedown to the southward, and is then divided again, one part continuing its course up to Windsor, and the other forming the Cornwallis tide, running up the river of that name.

As an assistance to vessels frequenting Eden Cove, and navigating the Basin of Mines, a small lighthouse has recently been erected on Partridge Island, which shows a fixed light at about 30 feet above the sea, visible 10 miles. The building is coloured white, and is octagon-shaped.

WINDSOR RIVER.—This is a small river on the south side of the Basin of Mines, leading to the town of Windsor. It is not very wide, but there is a depth of 6 fathoms at the entrance, which rapidly decreases to 2 fathoms as you proceed up. Before the entrance there are some shoals, for which reason no stranger ought to attempt to run up without the assistance of a pilot. As some assistance to the navigation of the river a small lighthouse has been erected on Horton Bluff, the west side of entrance, which shows a fixed light at 95 feet above the sea, visible about 15 miles. The following remarks on the river were written as far back as 1824:—"In running into Windsor River, a house on Horton Bluff (within the river on the west) should be kept on a South bearing, and the gap in the land formed by Parsborough River, North; this will take you through the channel between the Flats, which cannot be passed by a vessel drawing 15 feet much before half-tide. Off Horton Bluff the ground is loose and slaty, and a ship will be liable to drag her anchors with a strong breeze, particularly at full and change; it might, perhaps, therefore, be better for men-of-war to moor across the stream, and fully one-third from the bluff.

The banks and flats appear to be composed of soft crumbling sandstone, which is washed down from the surrounding country in great quantities during the spring; and, by accumulating on them, are constantly increasing their height, and, consequently, lessening the depth of water over them."

Between the Windsor River and the Cobequid River, the river in the eastern part of the Basin of Mines leading to Truro and Onslow, there are extensive flats which are mostly dry at low water. These extend 6 miles from the shore, and have deep water close to their edges, so that they require careful navigation to avoid. There are also dangerous flats lying off from the north shore, so that a shipmaster must have an intimate knowledge of the channel, to enable him to take his vessel up the Cobequid River.*

The Cornwallis and Horton Rivers, westward of the Windsor River, have an entrance common to each. There are flats before them, and none but the smallest vessels can run up them.

HAUT ISLAND is situated at the entrance of the Mines Channel, and forms a

* On Burnt-coat Head, on the south side of the river, leading to Truro and Onslow, there is a small fixed light, shown from a square white building, at the height of 75 feet, and visible 13 miles in clear weather. From the lighthouse Cape Blow-me-Down bears W. by N. ¾ N., 26½ miles; the Brick-kiln Ledges N.W. ½ W., westerly, 7½ miles; and Economy Point N.W. ¾ N., 4 miles.

prominent and very remarkable object from the height and steepness of its rocky cliffs, which, in a most singular manner, seem to overhang its western side. At its eastern end, however, there is a moderately good landing-place, and anchorage at half a mile off, in 18 fathoms, with the low point bearing about N.E. by N.; here, also, is a stream of water running into the sea. The east end of this island bears from Cape Chignecto S.W. ½ S., 4 miles, and from Cape D'Or W. ½ N., 9 miles. The position of the centre of the island, as determined by Capt. Owen, R.N., by astronomical observation, is in lat. 45° 15′ 6″ N., and long. 65° 0′ 6″ W.

Cape D'Or and Cape Chignecto are high lands, with very steep cliffs of rocks and red earth, and deep water close under them. There is nearly the same kind of shore to the head of Chignecto Bay, where very extensive flats of mud and quicksand are left dry at low water. The tides come in a bore, and rush in with great rapidity, and are known to flow, at the equinoxes, from 60 to 75 feet perpendicular. This renders the Basin of Mines, and many of the rivers hereabout, navigable to a great extent, even up to Londonderry, Windsor, and Onslow, at the extremity of Cobequid River.

It is high water, on the full and change, at Cape D'Or and Cape Chignecto, at 11h.; and spring-tides generally rise from 30 to 40 feet. Off Cape Split, at 10h. 15m.; springs rise 40 feet; and on the south side of the Basin of Mines, at 11h. 30m., spring-tides rise about 38 feet.

CHIGNECTO BAY is divided from the Mines Channel by the peninsula, of which Cape Chignecto is the western extremity. It runs up E.N.E., and may be considered as the north-eastern branch of the Bay of Fundy.

Having advanced about 12 or 13 miles within it, you will see on the northern shore Cape Enragé, or Enraged Cape, on which is a lighthouse of a square form, painted white, which shows a fixed light at 151 feet above the sea, visible 15 miles between the bearings of N.W., by the south, to N.E.

Nearly opposite to Cape Enragé is Apple River lighthouse, on the southern shore. The lighthouse stands on Hetty Point, on the northern side of the Apple River, and is about 3 leagues eastward of Cape Chignecto, in about lat. 45° 26′ N. It is a square white building, showing two fixed lights horizontally. These lights are 40 feet above the level of the sea at high water. The rise and fall at spring-tides here is 55 feet.

At about 11 miles beyond Cape Enragé, the bay divides into two branches, the one leading to Cumberland Basin and the River Missiquash, which runs across the isthmus, and is the boundary between Nova Scotia and New Brunswick; the other branch runs northerly to the Petcudiac River.* The Cumberland branch is navigable to within 13 miles of Verte Bay, in the Gulf of St. Lawrence; and it is remarkable that when the rise of tide in the Cumberland Basin is 60 feet, that in Verte Bay is only 8 feet.

From Cape Enragé towards Quaco the land is good, but much broken with steep declivities; the weather is generally humid, the winds boisterous and changeable with limited and short intervals of sunshine. From Quaco to St. John's the island is high, and the interior hills rise in easy inequalities; the ravines of the cliffs are deep and gloomy, and the indents have beaches. Black River, west of Quaco, distant 12 miles, although dry from half-tide, is a safe inlet for a small vessel.

Quaco Ledge is a dangerous shoal of gravel, upon which many vessels have grounded, situated about 12 miles S.E. ½ E. from Quaco; it extends from N.W. by N. to S.E. by S. about 3⅓ miles, and is half a mile broad; and there are several irregular patches of rocks lying off its N.E. side. This ledge shows itself at half-tide, and dries for about 100 yards, having but 12 feet of water over it at common tides. At half a mile to the N.E. the eddies with the flood-tides are strong and numerous, the ship's head going nearly round the compass in the space of half an hour; the ebb is a true tide, and sets in a W.S.W. direction towards the ledge. The soundings are from 7 to 14 fathoms, at about 2 cables' lengths all the way round; but they shoal more gradually from the

* On Grindstone Island, at the entrance to this river, there is a small white octagonal building which shows a fixed light at 60 feet above the sea, visible 12 miles. According to Captain Shortland, R.N., its position is in lat. 45° 43′ 13″ N., long. 64° 37′ 25″ W.; being a difference of about 10 miles between it and the longitude hitherto assigned to the island. Cape Enragé lighthouse bears from it S.W. by W. ½ W. 10 miles.

N.E. The mark to go clear to the southward of the Quaco Ledge, is Cape D'Or on with the south side of Haut Island. Its position, as determined by Captain Owen, R.N., is lat. 45° 15′ 2″ N., and long. 65° 23′ 25″ W.

On a small rock off *Quaco Head* is a lighthouse painted white and red, in horizontal stripes. It shows a bright light visible about 15 miles, which revolves every 20 seconds, during which time it appears for 14 seconds, and is dark the remaining 6 seconds. The position of the building is lat. 45° 19′ 35″ N., and long. 65° 31′ 55″ W. Spring-tides rise 24 feet, and neap-tides 20 feet.

ST. JOHN'S HARBOUR.—The entrance of this harbour bears from the entrance of the Gut of Annapolis N. ½ W., 11 leagues, and may be distinguished by the light-house on Partridge Island, which shows a fixed light at 119 feet above the level of the sea, visible 20 miles. The tower is painted red and white, in vertical stripes, and is furnished with a bell, to be tolled in thick or foggy weather; its position is lat. 45° 14′ 2″ N., and long. 66° 3′ 30″ W.

As a guide to vessels making St. John's, a large iron fog-bell has lately been placed in 7¼ fathoms, at the entrance of the harbour. It lies with Cape Spencer bearing S. 59° E.; Cape Mispick, S. 62° E. 3¾ miles; Partridge Lighthouse, N. 21° E. 1½ miles; Sheldon Point, N. 49° W. 1¾ miles; Medginish south-east point, N. 76° W. 2 miles; Cape Negro, red mark, S. 81° W. 4¼ miles; and Cape Split, S. 78° W. The height of the bell above the buoy is 19 feet.

A *beacon light* is shown within Partridge Island, from a tower erected upon a spit or bar which runs out from Sand Point S.S.E. about half a mile, and which dries at two-thirds ebb. This light is of great utility to the coasters, and all other vessels having pilots on board, as it enables them to enter the harbour at all hours of the night.

North-east from the beacon light, just off the town, is a ridge of rocks which is covered at 2 hours' flood; from this ridge and eastward of the town are extensive flats of sand and mud, which dry at low water, and extend along the road to Cranberry Point, stretching off about 2 cables' lengths.

The bottom, for several miles southward of Partridge Island, is muddy, and the depths gradual, from 7 to 20 fathoms, affording excellent anchorage; the passage west-ward of this island has in it 10 feet; that to the eastward has 16 feet; and abreast of the city are from 7 to 12 fathoms.

A breakwater has been erected on the eastern side of the entrance to the harbour, below the town, for the purpose of reducing the inset of the sea, especially during a southerly gale.

The CITY OF ST. JOHN stands on the River St. John near its mouth, and carries on a considerable trade, and many ships are built here. Within the harbour is a valuable fishery, where large quantities of salmon, herrings, and chad are cured for exportation. In the most severe winter it is free from the incumbrance of ice. The country on the banks of the river abounds in excellent timber, coal, limestone, and other minerals. Partridge Island is about 2 miles to the southward of the city, answering the double purpose of protecting the harbour, and, by its lighthouse, guiding and directing the mariner to its entrance.

The entrance into the river, 2 miles above the town of St. John, is over the Falls, a narrow channel of 80 yards in breadth, and about 400 long. This channel is straight, and a ridge of rocks so extends across it as to retain the fresh water of the river. The common tides flowing here about 20 feet, at low water the level of the river is about 12 feet higher than that of the sea; and, at high water, the level of the sea is from 5 to 8 feet higher than that of the river; so that, in every tide, there are two falls, one outward and one inward. The only time of passing this place is when the water of the river is level with the water of the sea, which is twice in a tide; and this opportu-nity of passing continues not above 10 minutes: at all other times it is impassable, or extremely dangerous. After passing the Falls, you enter into a gullet, which is about a quarter of a mile wide, and two miles long, winding in several courses, and having about 16 fathoms in the channel. Having passed this gullet, you enter a fine large basin 1½ mile wide, and 8 miles long, which enters the main river. The river branches some hundreds of miles up, in a serpentine manner, and runs through a country which abounds with timber, coal, limestone, and many other minerals; and the surrounding lands are now becoming highly cultivated. There is water enough to navigate vessels of 50 tons as high as Frederickton, and in all the branches of the lakes adjacent, except in dry seasons. At times of great freshes, which generally happen between the

beginning of April and the middle of May, from the melting of the snow, the Falls are absolutely impassable to vessels bound up the river, as the tide does not rise to their level.

The following directions for St. John's Harbour and Meogenes Bay were written a few years since by Mr. Backhouse. It should be mentioned that from Captain Owen's survey it would appear that the passage on the east side of Partridge Island is the best, there being in the other only 7 to 12 feet, and some shoal spots of less water at low tide.

"When you make Meogenes Island, or Partridge Isle, so as to be distinguished from the lighthouse on the latter, then make a signal for a pilot, and the intelligence from Partridge Island will be immediately communicated to the city of St. John, whence a pilot will join you. Should the wind be contrary, or any other obstruction meet you, to prevent your obtaining the harbour that tide, you may sail in between the S.W. end of Meogenes Island and the main, or between the N.E. end and the main, and come to anchor in 4 or 5 fathoms at low water, mud and sandy bottom. The mark for the best anchoring ground here is, to bring the three hills in the country to the N.E. in a line within Rocky Point Island,* and the house on Meogenes Island to bear S.E. by S.

Should the tide of ebb have taken place at the beacon, you must not, by any means, attempt to gain the harbour that tide, but wait the next half-flood, to go over the bar, as both sides of the entrance of this harbour are nothing but sharp rocks dry at low water: and the tide of ebb is so rapid in the spring, when the ice and snow are dissolved, that all the anchors on board will not hold the ship from driving.

On the Nova Scotia side of the Bay of Fundy, your soundings will be from 50 to 60, 70, 80, to 95 fathoms; stones like beans, and coarse sand; and as you draw to the northward, the quality of the ground will alter to a fine sand, and some small shells with black specks. Approach no nearer to the south shore than in 50 fathoms; and, as you edge off to the N.W. and W.N.W., you will fall off the bank, and have no soundings.

When you have passed Meogenes Island, edge in-shore toward Rocky Point, until Meogenes Point (*Negro Head*) is in a line over the N.W. corner of Meogenes Island; sailing in between Rocky Point and Partridge Island, with these marks in one, will lead you in the best water over the bar (9 to 15 feet), until you open Point Mispick to the northward of the low point on Partridge Island; then starboard your helm, and edge towards Thompson's Point, until the red store, at the south end of St. John's, is in a line over the beacon; keep them in one until you pass the beacon at a distance of a ship's breadth; then haul up N.N.W. up the harbour, keeping the blockhouse, at the upper part of the harbour, open to the westward of the king's store, situated close to the water side, which will lead you, in mid-channel, up to the wharves, where you may lie aground dry, at half-tide, and clean your ship's bottom, or lie afloat in the stream at single anchor, with a hawser fast to the posts of the wharves on shore.—N.B. The tide of flood here is weak, but the ebb runs very rapidly all the way down past Meogenes Island."

The following directions are based on the details of the survey of Lieutenants Harding and Kortright, acting under the orders of Captain W. F. W. Owen, of the Royal Navy, in 1844.

When running for St. John's avoid the rocky ledge running off Inner Mispick Point, the eastern side of the entrance, to the distance of $2\frac{1}{2}$ cables' length, and which is steep-to, with 30 to 40 feet close off; and having brought the stone barracks in one with the Wesleyan Chapel,† at the back of the town, bearing N. $\frac{3}{4}$ E., steer in with this mark on, and it will carry you outside of the shoal water extending from the eastern side of Partridge Island. When Carleton Church comes in one with the cliff end (the termination of the cliffs forming Negro Point), bearing about N.W. $\frac{3}{4}$ N., you must change your course to this direction, and it will lead you in from 15 to 22 feet at $1\frac{1}{2}$ cable's length to the northward of the shoal ground extending between Partridge Island and Negro Point. Continue in this direction until the stone church at the back of the town comes on the end of the breakwater, when you

* This is an islet, lying at a cable's length from the point, and more properly named the *Shag Rock*. It is surrounded by sunken rocks.

† This building will be known by its octagonal tower with a circular top. It is situated in the N.E. part of the town.

must run up with this mark past the beacon-light into the harbour. When just above the beacon-light steer N. by W. or N. by W. ¼ W., and anchor off the town. Be careful to keep the lead going when following these directions, that you do not strike on the shoal spots.

To the north-eastward of the beacon-light, and just off the town, is a ridge of rocks which is covered at 2 hours' flood. From this ridge, and eastward of the town, there is an extensive flat of mud and sand which dries at low water; this extends along the coast to Cranberry Point, and runs about 2 cables' lengths from the shore. Cranberry Point is cliffy, and has some rocks running off it.

It is high water on the days of full and change at 11h. 44m.; spring-tides rise 23 to 25 feet, and neaps 21 to 23 feet.

SIGNALS.—The following signals are displayed at Partridge Island, on the approach of vessels to the harbour of St. John:—

One ball close for	1	square-rigged vessel.
One ball half-hoisted for	2	„
Two balls close for	3	„
Two balls separated for.....	4	„
A pendant of any colour for.....	5	„
A pendant under a ball for	6	„
A pendant over a ball half-hoisted for.....	7	„
A pendant under two balls close for	8	„
A pendant under two balls separated for .	9	„
A flag of any colour for	10 or more.	

The above are displayed at the east or west yard-arm, according to the direction in which the vessels are at first observed; and as soon as their rig can be distinguished, descriptive colours will be hoisted at the mast-head in the following order:—

A union jack, with a white pendant over	for	a small armed vessel.
A blue pendant	„	merchant ship.
A red ditto	„	merchant brig.
A white and blue ditto	„	foreign vessel.
A white ditto (without a ball)	„	top-sail schooner or sloop.
A red flag, pierced white	„	steamboat from St. Andrew's and Eastport.
A ball at the mast-head	vessel is on shore or in distress.	

Should immediate aid be necessary, guns to be fired. In foggy weather, a gun will be fired on Partridge Island in return for each heard at sea. Should a vessel require a pilot, her descriptive pendant will be displayed at a yard-arm, in the place of a ball.

In regard to the time for going through the Falls, near St. John, it may be mentioned that the Falls are level (or still water) at about 3½ hours on the *flood*, and about 2½ on the *ebb*, which makes them passable four times in twenty-four hours, about 10 or 15 minutes each time. No other rule can be given, as much depends on the floods in the River St. John, and the time of high water or full sea, which is often hastened by high winds, and in proportion to the height of them.

To the W.S.-westward of Meogenes Island is Flat Bay, in which the depth is 5 and 4 fathoms water. It is a small harbour occasionally used by coasters. Hence the land runs nearly W.S.W., passing Negro Head, and Halfway Point (on which is a white horizontal stripe, about 5 feet broad, and which appears to be 40 feet long), to Cape Musquash, which is 9 miles from Partridge Island. Close off Cape Musquash is the Split Rock, with 8 fathoms very near it; this rock is marked by seven white balls, six of which are distinctly visible at a distance of 10 or 12 miles.

MUSQUASH HARBOUR lies about a mile to the westward of the Split Rock. Its entrance is about half a mile wide, and there is a good anchorage a little way in, with 4 fathoms water; but farther on a bar runs across the harbour, over which are only 1½ fathoms. Small vessels sometimes pass to the westward of the islands, and run up the river, which, when past the bar, has 2, 2½, and 3 fathoms water. This harbour is open to the so[illegible]ward.

On Musquash Inner Head, to the westward of the Split Rock, is a white vertical stripe, visible from the westward, with two of the balls on the Split Rock; but on coming up the bay, when the stripe is lost sight of, the whole of the balls on the Split Rock are seen. Besides the above there is a beacon on Gooseberry Island with the letters G I marked on it, and the top of the pinnacle painted white. The white

mark can be seen at some distance from the S.W., but the letters are only visible when the island bears North.

From the entrance of Musquash to Point Lepreau, the coast runs to the westward nearly 10 miles, and is irregular, with a few inlets. The first of these inlets is about 1½ mile to the westward of Musquash western point, and of no note whatever; in your way to it, a berth must be given to the shore, particularly about Musquash Point, on account of some rocks lying off that part; there are channels between these rocks, but few vessels will venture through them. Besides this inlet there are Chance and Little and Great Dipper Inlets, but they are of little use, and too difficult of access to be run for. Hence to Point Lepreau the coast is high and broken, and must be avoided on account of the rocks lying off it.

POINT LEPREAU.—On Point Lepreau there is an octagon-shaped building, painted red and white in horizontal stripes, which shows two fixed lights, vertically, at 81 and 53 feet above the sea, visible 15 miles. The range is about two-thirds of the circle from W.N.W., round by south, to E. by N. A gun is fired to answer signals. The building bears from the easternmost Wolves E. by N., distant 11 miles: its position is lat. 45° 3′ 50″ N., and long. 66° 27′ 4″ W.

Westward of Point Lepreau, and between it and Red Head, is Maces Bay, in which are numerous islets and rocky ledges, so that it is a place rather to be avoided than frequented. On its eastern side is a rocky ledge running out from the shore fully 1¾ mile in a S.W. ½ S. direction, which dries at low water. It may be cleared on the south side by bringing the lighthouse on Cape Lepreau to bear S.E., and on the west side the Brothers' Islets N. by E.; these marks will avoid the ledge in 13 fathoms, and it must not be approached nearer as it is steep-to. At the head of the bay is Mink Island, within which is anchorage for small vessels.

At the back of Maces Bay is Lepreau Bay and River, in which is good anchorage in 4 or 5 fathoms, and shelter from the south-eastward; here are some saw-mills, at which deals are cut. In running for this place avoid the rocky ledge previously mentioned, and enter the bay, passing the Brothers' Islets on the west side. From the Brothers' a ledge runs to the eastward joining the shore.

W. by S. from Point Lepreau, distant 3½ or 4 miles, there is stated to be a shoal, of which the actual situation is not known; if such should exist, it must be surrounded with very deep water, for a short distance from its presumed position there are 26, 28, and 31 fathoms, mud, mud and sand, and gravel.

BEAVER HARBOUR lies 7 miles to the westward of Red Head; between is a small place named Seely Cove, in which small vessels may occasionally anchor for a short time. Beaver Harbour is an excellent place to run for when caught by an easterly wind, and unable to reach St. John's Harbour, as it is above a mile wide at the entrance, with 10 fathoms water on each side, and 15 fathoms mid-channel, and there are no dangers at the entrance going in. In entering, keep the western shore aboard, until you bring the Goal Rock to bear East, distant about half a mile, when you may anchor in 4 or 5 fathoms, good holding-ground. It is said that there are no regular pilots, but that the fishermen on the coast are well qualified for the task; although in clear weather they are not absolutely necessary.

At about 1¼ mile from Beaver Harbour is a small island close to the shore, named Little Moose Island; around it there are rocks, and close off it to the southward are 8 to 15 fathoms. Hence to Deadman Bay the distance is 1¼ mile.

Deadman Bay is a small bay running in to the E.N.E., about 1⅓ mile. It is not more than ⅓ of a mile wide, but in it there is a depth of 10 to 7 fathoms, which rapidly decreases towards the head of the bay until it becomes dry. Off Deadman Head, the south point of the bay, there is a half-tide rock, close to which there are 5 and 10 fathoms, so that it must be cautiously avoided. This bay occasionally affords a temporary shelter to the small coasting vessels.

ETANG HARBOUR.—This harbour affords excellent and well-sheltered anchorage, but the access to it being intricate the assistance of a pilot is requisite to enable a stranger to run in—none but the coasters being able to dispense with such assistance. It is situated about 4 miles to the westward of Beaver Harbour, and in it there is a depth of 16 to 10 fathoms, which decreases to 8, 6, and 3 fathoms, towards the outlet of the Etang River, in the north-eastern part of the harbour. The town is built on a small point jutting out from the main land, and carries on a considerable trade in deals.

On the western side of Etang Harbour are Cailiff, McCann, White, and Bliss

Islands, having about them a number of smaller islets and rocks. The approach to the harbour is either through Bliss Harbour, the sheltered anchorage existing between Cailiff and Bliss Islands; or, to the eastward of all the islands, through the narrow passage formed by them with the eastern shore. If the former passage be adopted, great care is necessary to avoid the Man-of-war Rock, a sunken ledge lying in mid-channel off the western end of Bliss Island; if the latter, to avoid the Roaring Bulls, some ledges on the eastern side of the channel near Pea Island, and the Mare and other rocks off the east end of Bliss Island on the western side of the passage. Besides these two passages into Etang Harbour, there is a third to the northward of Cailiff Island, but it is so narrow, and at the head of the island so shallow and encumbered with rocks, that it is not suitable for anything much larger than boats.

In Bliss Harbour, there is good sheltered anchorage in 6 fathoms, protection being afforded to the southward by Bliss Island. A small vessel may also anchor in 8 fathoms in Fisherman's Cove, on the north side of that island.

At Etang Harbour it is high water on the days of full and at change of the moon at 11h. 10m.; spring-tides rise 21 to 25 feet, and neaps 21 to 22 feet. The variation of the compass in 1847 was 17° W.

WOLF ISLANDS.—The Wolves are three or four islands from 60 to 100 feet high, situated 5 miles to the southward of Etang Harbour; they may be passed on either side, there being deep water close to them; but among them there is no sheltered anchorage, except for small vessels in the summer time. With light winds, a lee-tide, or thick weather, you may let go anchor anywhere between the Wolves and Beaver Harbour, in good holding ground, with a depth of 20 to 25 fathoms.

GRAND MANAN.—This island lies at the entrance of the Bay of Fundy, commands an uninterrupted view of every vessel that passes to or from it, and has several good harbours to which they may run for shelter. The nearest part of its north-western shore is distant 5¾ miles from Quoddy Head, on the coast of Maine, and White Head Island, off its south-east side, is about 25 miles from Bryer's Island. The soil of the island is generally considered to be good, and the inhabitants are enabled to raise from it the productions of the neighbouring land. The woods, consisting of firs, beech, birch, maple, &c. &c., are equal in size and quality to any grown in America.

The *western side* of the island is very straight and uniform, consisting of cliffs which rise to the height of from 180 to 400 feet above the sea level. On this side there is but one small inlet in the whole range of cliffs, and that only capable of affording shelter to boats, though very small vessels, it is said, may run through the narrow entrance at 2 hours before high water; it is situated about 4 miles south-westward from Bishop's Head, the north point of the island, and is commonly called the Dark Cove, being enclosed by a low and narrow sand-bank, within which are 5 and 7 fathoms. Along this coast as far as the South-west Head, there are 3, 4, 5, and 6 fathoms close to the land, deepening to 13, 30, and 40 fathoms at ½ a mile off, and thence rapidly to 45 and 50 fathoms at the distance of a mile. The flood, running northward, follows the direction of this coast, and the ebb the same, setting to the southward; at springs their velocity ranges from 2½ to 3 knots an hour.

Bishop Head, the western extremity of which is named Long Eddy Point, forms the northern point of Grand Manan, and is abrupt and bold, having at the distance of ¼ of a mile off it a depth of from 30 to 40 fathoms. The land over it rises to an altitude of 300 and 350 feet.*

The *eastern side* of the island is of a nature the very contrary to the western, being lower and much indented, and having numerous islands off it, between and among which are several excellent harbours, where, under the guidance of local knowledge, the largest vessels may obtain shelter.

Whale Cove is on the eastern side of Bishop Head, between it and Swallow's Tail; here small vessels occasionally ride during southerly winds to await a turn of the tide. In it the depth is 12 to 4 fathoms, and the anchorage is said to be moderately good, but it would be very imprudent to remain here during northerly winds.

LONG ISLAND BAY lies to the south-eastward of Whale Cove, and is formed by the

* It is intended (1859) to erect a lighthouse on the northern end of Grand Manan.

Swallow's Tail,* a bold, high, ragged, and barren-looking point, and by Long Island, which bears S. by W. from its extremity, distant 1½ mile. The bay is open, but possesses all the advantages of a harbour, and affords good shelter from the westward; the soundings vary from 12 to 5 fathoms, bottom almost wholly of mud, except a ridge of rocks and gravel that extends from the ledge which shows itself within the Swallow's Tail; some rocks lying ¼ of a mile off the north end of Long Island, and becoming awash at low water springs; and the Dutch Ledge, which extends half way over from the shore towards Long Island, and covers at the last quarter flood. In *Flag's Cove*, the northern corner of the bay, the depths are from 5 to 8 fathoms, bottom of stiff clay, and vessels have frequently been protected there during a severe gale; when rounding the point next within Swallow's Tail do so at a berth of 2½ to 3 cables' lengths, to avoid the ledge just mentioned, the outer part of which uncovers at the last quarter ebb. Also, just within and westward of the north point of Long Island, ships may anchor in from 12 to 18 feet, even locking in the north end of Long Island with Swallow's Tail, on a strong muddy bottom, entirely sheltered from the wind and sea, but when making for this anchorage, the north end of Long Island should be rounded at a distance of not less than 3 or 4 cables, to clear the two shallow patches lying off it, and then the island shore should afterwards be approached, to avoid the Dutch Ledge running ⅔ of a mile off from the main; Long Island is joined to Grand Manan by the Farmer Ledge, which is always visible.

Southward of Long Island are High, Low, and Big Duck Islands; the two former are connected with one another and with Nantucket Island and Grand Manan by rocky ledges, and have to the northward and southward of them two small bays, wherein are from 3 to 8 fathoms, but it is not recommended to run for either. All three islands should have a berth of ½ a mile or more, to avoid the rocks surrounding them. Here the flood runs north, and the ebb south, at a rate of between 2 and 3 knots per hour. A long and narrow ledge, 1⅓ mile in length, runs southward from Big Duck Island, the top of which, near the extremity, is always visible; within this ledge, between it and Ross, Cheyne, and White Head Islands, is a deep bay, which vessels may enter and run up northward along the inside of the ledge, and anchor under the western side of Big Duck Island, in 3 or 3½ fathoms, good holding ground. A shallow but narrow flat connects the north end of Big Duck Island with Ross Island, which latter is joined to Cheyne, and Cheyne to White Head Island, by broad flats composed of sand and rock, and dry at low water.

White Head Island is the largest and outermost of the islands on the south-east side of Grand Manan; here resides, or did reside, an able and active pilot. It is surrounded with reefs, those on the western side being distant one mile from it, and those on the eastern projecting outwards about half a mile. The space to the southward of the island for the distance of nearly 4½ miles, and with a breadth of 2½, is occupied by a number of detached rocks and shoals, with deep water channels between and around them, which take the general name of the

MANAN LEDGES, and consist of the Black Rock, the north-easternmost, which is about 10 feet above high water; the Brazils, uncovering at low springs; the Tinker, or north-westernmost, which dries at low water, except at very small neaps; the Diamonds, just seen at low water springs; the Crawley Shoal, of 18 feet; the Rans, or westernmost; the Proprietor, a rock just seen at low water, having foul ground extending nearly ¾ of a mile southward from it; and the Old Proprietor, or the outer and southernmost of these dangers, which uncovers at half tide. Over and through the channels among these rocks there is a rapid tide-current of from 4 to 6 knots an hour, the flood running eastward and north-eastward and the ebb south-westward and westward, and for a considerable distance south-eastward from the Black Rock is a very heavy tide-rip, on the ebb, known by the name of Bull Head Rip. These ledges should therefore have a wide berth, and strangers should very carefully avoid being drawn into either of the passages among them. To avoid them on their eastern side keep Big Duck Island well open eastward of the Black Rock, N. ¼ E., gradually hauling to the north-eastward as you approach that rock; and to go clear of the southernmost, keep the S.W. Head of Grand Manan well open southward of the South Point of Three Islands, bearing N.W. by W. Another mark given to lead clear to the eastward of all these dangers is, the north-easternmost high land of Manan well open of the Long and Duck Islands. During an easterly wind the tide-rips are impassable.

* A lighthouse is in course of erection on Swallow's Tail.

The Old Proprietor, as before observed, is the outermost and most dangerous of the Manan Ledges, dries at half ebb, covers a space of half an acre at low water, and when covered has the tide setting strongly over it. There are from 25 to 35 fathoms at $\frac{1}{4}$ of a mile southward of it, and when upon it Gannet Rock lighthouse bears W. by S. $5\frac{3}{4}$ miles, the Black Rock N. by E. $3\frac{3}{8}$ miles, and the South Point of Three Islands N.W. by W. $\frac{1}{2}$ W. 4 miles. The narrow ridge of foul ground running southward from the Proprietor, upon which are from 2 to 4 fathoms, is $\frac{1}{4}$ of a mile westward of the Old Proprietor. The Clark's Ground, a rocky shoal of 6 and 7 fathoms, over which the ebb creates a heavy rippling, lies $1\frac{1}{8}$ mile N.E. by E. $\frac{3}{4}$ E. from the Old Proprietor; and another, called the Roaring Bull, whereon are 6 or 8 fathoms and usually a heavy and dangerous ripple, is said to lie 3 or 4 miles eastward of it.

GRAND HARBOUR is a small and shallow inlet, formed on the south-eastern side of and between Grand Manan and Ross Islands. At its entrance are 5, 4, and 3 fathoms, decreasing to $2\frac{1}{2}$ and 2 as you proceed inwards in mid-channel towards the mud flats at the head of the bay, which are dry at low water. This is a convenient place for ships without anchor or cable, as vessels may enter and lie securely on mud. The channel is very narrow, but protected from the sea. High water takes place on the days of full and change at 11h. 4m.; springs rise $17\frac{3}{4}$, neaps $14\frac{1}{2}$, and neaps range $11\frac{1}{4}$ feet.

When making for this harbour in an emergency, you may proceed in between the western side of the Manan Ledges and the Three Islands, or between the Three Islands and Wood Islands, but the aid of a pilot should be obtained. If no such help can be had, and there is no alternative but to run for this place, then in the former case keep to the southward of the Old Proprietor by the marks just given, and bring Mark's Hill (the greatest elevation on the south side of Grand Manan) open southward of Green Islands (the next within Three Islands), bearing N. by W. $\frac{1}{2}$ W., which will carry you between the Rans, Diamond, and Tinker Rocks on the eastern, and Three Islands on the western side, and when within $\frac{1}{2}$ a mile of the Green Islands haul up so as to pass on either side of them in a berth of $2\frac{1}{2}$ or 3 cables; but in passing on their eastern side remember the ledge that lies nearly $\frac{3}{4}$ of a mile off the conspicuous white cliffs on the western side of White Head Island, and dries at the last quarter ebb. When abreast the northern Green Island, the entrance of the harbour will be seen in a N.N.-easterly direction, and should be steered for so as to pass up in mid-channel, by leaving two very small islands not more than $\frac{1}{8}$ a mile to starboard. Coming in from the westward pass round S.W. Head, keeping within the distance of 3 miles to avoid Middle Shoal and Wallace Ledge, and steer in N.E., midway between Wood and Three Islands.

Three Islands, or Three Kent Islands, are low and ledgy. The eastern side of the largest is bold to the rocks, which are at all times visible. About $\frac{3}{8}$ of a mile off their N.W. side is a ledge named the Constable, dry at low water. Under the lee of these and the Green Islands, anchorage may occasionally be obtained in from 14 to 7 fathoms. There is, however, a small spot of $3\frac{1}{4}$ fathoms half a mile off the middle of the western side of the Three Islands, which must be avoided.

The Kent Shoal also must be guarded against when using the channel inside the Murr Ledges; it has $3\frac{1}{2}$ fathoms on it, gravelly bottom, is small and steep-to, and lies 2 miles N.N.E. $\frac{1}{2}$ E. from Gannet Rock lighthouse.

SEAL COVE runs in $3\frac{1}{2}$ miles north-eastward, between Wood Islands and the S.W. Head of Grand Manan. It has a clear channel nowhere less than $\frac{3}{4}$ of a mile wide, and from 5 to 10 fathoms deep, and forms an excellent harbour, the upper part and head of which, in a gale of wind, are places of security; supplies, if requisite, may be obtained from the inhabitants. With the exception of the Bucks Rock, which lies about 3 cables' lengths off the western side of the entrance, generally breaks, and shows at $\frac{3}{4}$ ebb, the whole of the western side of the cove is free from danger beyond 2 cables' distance, but the shores of the Wood Islands should have a berth of $\frac{1}{8}$ a mile given them.

THE MURR LEDGES are a number of detached rocks lying westward of the Manan Ledges, and southward of the S.W. Head of Grand Manan; they are surrounded and separated by deep water, and, in some cases, wide channels, but no stranger should attempt to go between them. The flood runs eastward and the ebb westward, over and among these dangers, with a velocity of 3 and 4 knots per hour. The easternmost bears the name of Gannet Rock; the southernmost, St. Mary's Ledge; the westernmost, Long Ledge; and the northernmost, that of Wallace Ledge.

The Gannet Rock is a small rock about 25 feet above water at high tide, with many

sunken rocks and ledges about it, and standing at the distance of 3½ miles S.S.W. from the south point of the Three Islands. The ledges and sunken rocks in the vicinity always break. The lighthouse on this rock shows a brilliant fixed light flashing 3 times in a minute, and visible at the distance of about 12 miles. The building is painted in vertical stripes, black and white, and stands in lat. 44° 30′ 40″ N., and long. 66° 46′ 48″ W. A gun is fired to answer signals during a fog.

This light, from its proximity to several very dangerous ledges and shoals, ought not to be run for; it is intended to give timely warning to vessels which are, by the rapid tides about these ledges, frequently drawn into danger, and too often wrecked. Neither ought vessels, except in cases of extremity, to attempt running between this rock and the Old Proprietor, as there are some dangers in the way, the ground rocky, and the tides run with great velocity.

The bearings of the lighthouse, from the dangers in the vicinity, are as follow:—From the Old Proprietor W. by S., about 5⅔ miles; S.W. Head of Grand Manan S.E. by S. ½ S., 7¼ miles; Wallace Ledge, the northernmost of the Murr Ledges, S.E. by E., 4¼ miles; Southernmost of ditto, named St. Mary's Ledge, E.N.E. ¼ E., 2¾ miles; and from the lighthouses on Machias Seal Island, E. by S. ½ S., distant 13¾ miles.

St. Mary's Ledge, the southernmost of the Murr Ledges, is very small, and covered only at high water of spring tides. Close-to all round it are from 5 to 19 fathoms. From Gannet Rock lighthouse it bears W.S.W. ¼ W., distant 2¾ miles, with from 12 to 25 fathoms between, and from the Yellow Ledge, the highest part of which is about 10 feet above high water, S.E. by E. ¼ E., ¾ of a mile, having a 4-feet rock between, which breaks with a moderate swell.

The Long Ledge, the westernmost of these dangers, and separated from the Yellow Ledge by a deep channel ⅓ of a mile across, extends thence N.N.E.-ward 1½ mile and is about 3 cables' lengths broad. Its northern part is just uncovered at high water, but on the southern half are patches of from 6 to 15 feet, and others awash at low tide. Almost close to its western side are soundings ranging from 10 to 18 fathoms. Between its northern end and Wallace Ledge, lies a small steep-to rock, just appearing above water at high water springs, and named the West Ledge.

Wallace Ledge, the northernmost of the Murr Ledges, uncovers at half ebb; it is small, and has 6 to 12 fathoms immediately off it all round. When upon this rock you will be 4¼ miles N.W. by W. from Gannet Rock Lighthouse; ¾ of a mile N. by E. ½ E. from West Ledge; 4 miles South from the S.W. Head of Grand Manan; and 9¾ miles E. ⅝ S. from the lights on Machias Seal Island. Between this ledge and the S.W. Head of Grand Manan there is a clear channel 10 to 22 fathoms deep, but between it and Machias Seal Island are four dangerous rocks, that must be very carefully avoided; they are named the Bull Rock, Middle Shoal, S.E. Ledge, and S.E. Shoal.

The Bull Rock, a small rock with but 2 feet water upon it, and from 9 to 23 fathoms around it, may generally be discovered by the breakers over it. It lies nearly 7 miles W. by N., northerly, from Gannet Rock Lighthouse; 6 miles S.W. by S. from Grand Manan S.W. Head; and 6¾ miles E. by S. ½ S. from Machias Seal Island lights; being 3 miles westward of the westernmost of the Murr Ledges, with soundings of from 15 to 27 fathoms between.

The Middle Shoal is likewise a very small patch with deep water all round, and only 18 feet over it. There is generally a rippling of the sea in its vicinity, and in heavy weather it always breaks. It bears N.N.W. distant 4⅝ miles from the Bull Rock; W. by S. rather more than 5 miles from S.W. Head; and E.N.E. 5⅛ miles from Machias Seal Island lights. Between this shoal and Grand Manan there is a clear passage, and also between it and the Bull Rock; but the North Rock and Shoal obstruct the channel between it and Machias Seal Island.

The S. E. Ledge has 5 fathoms upon it, rocky bottom, makes a tide-rip, and breaks only in heavy weather. It lies 6⅓ miles W. ¼ S. from the Yellow Ledge (of the Murr Group); S.W. ⅓ W. 3¾ miles from Bull Rock; and S.E. ½ S. 5¾ miles from Machias lights.

The S.E. Shoal is a very dangerous patch of 7 or 8 feet water, of but small extent, steep-to, and breaks in heavy weather. It is distant 1¼ mile S.E. from Machias Seal Island Lighthouses, and has from 15 to 30 fathoms between, except in one little spot, where are only 12 feet; this is situate about ¼ of a mile from the island. The flood runs over this shoal to the N.E. by N., and the ebb S.W. by S., with a velocity of about 3 knots per hour.

Among the foregoing dangers are two or three shallow spots of 6, 7, and 8 fathoms, which generally show themselves by a rippling of the tide, but the foregoing are the only rocks that have been at present discovered between the Murr Ledges and Machias Seal Island. Still a stranger would, if circumstances permitted, act wisely in keeping well outside all these ledges, and not attempt any of the passages among them.

MACHIAS SEAL ISLAND, &c.—Machias Seal Island is 3 cables in length, and 2 in breadth where broadest, and about 20 feet above high water. A ledge extends ½ a mile north-eastward from its north end, upon the middle of which is a rock always above water, and connected with the island by a part of the ledge that becomes dry at low tide. On its eastern side, besides the S. E. Shoal above described, there is a spot with only 12 feet on it and 12 fathoms around it, lying ⅓ of a mile E.S.E. from the south point of the island, with 13 fathoms between. On the other sides of the island deep water of 13 and 14 fathoms will be found at less than 2 cables' lengths off. Near the middle of the island, in lat. 44° 30′ 7″ N., and long 67° 6′ 15″ W., are two buildings of a white colour, which bear from each other E.S.E. and W.N.W., distant 165 feet. They exhibit fixed lights at 58 and 54 feet above the sea, visible about 15 miles, and are intended as leading lights for clearing the Murrs and other dangers southward of Grand Manan. Vessels standing to the northward and the lights to the westward, 5 miles, when they bring the lights in range, or covering one another, must tack to avoid the Murr Ledges. A gun is fired every 4 hours during a fog as a warning to vessels. From the circumstance of two lights being shown from the same station they will be easily recognised.

From the lighthouses the S.E. Shoal bears S.E. 1¼ mile distant; the S.E. Ledge S.E. ½ S. 5¾ miles; St. Mary's Ledge, the southernmost of the Murr ledges, E.S.E., southerly, 11½ miles; Wallace Ledge, the northernmost of that group, E. ½ S. 10 miles; the S.W. Head of Grand Manan E. by N. ½ N. 10¼ miles; the Middle Shoal E.N.E. 5½ miles; and the North Shoal N. ½ E. 1⅝ mile.

At 3½ miles, West, from the Seal Island Lighthouses is a rock, which has caused the wreck of several vessels. It was seen by a Captain Johnstone, of the ship Liverpool, trading to St. John's, in 1834, and is said to be well known to the regular traders and pilots.

The North Rock, about 4 feet above high water at spring tides, is situated on the middle of a shoal of 3½ fathoms, which is about ⅓ of a mile in extent from E.S.E. to W.N.W. Around this rock are from 6 to 14 fathoms almost close to, and there is always a rippling of the tide in its neighbourhood. When on the rock the lighthouses on Machias Seal Island bear S.W. by S. 2¼ miles distant, and there are from 15 to 46 fathoms in the channel between it and the ledge extending from the north end of that island.

The North Shoal breaks in heavy weather, has 7 or 8 feet over it, and 9 and 12 fathoms around. It is very small, and bears from the lighthouses N. ½ E. 1⅝ mile, and from the North Rock W. by S., distant rather more than 1 mile. Between it and Machias Seal Island the depths range from 20 to 50 fathoms, and between it and the North Rock from 15 to 25 fathoms. All around and over this shoal there is always a rippling sea.

GRAND MANAN BANK has soundings over it varying from 24 to 30 and 40 fathoms, and makes a tide-rip of very great extent. The flood sets over it in a north-easterly direction, and the ebb in a south-westerly, at a rate of about 1½ mile an hour. Its shoalest part (24 fathoms) is situate in lat. 44° 14½′ N., and long. 67° 3′ W., or 15¾ miles S. ¾ W. from Machias Seal Island Lighthouses. Around it the depths soon increase from 40 to 46, 60, and 70 fathoms.

Between Great Manan and the coast, the channel is from 6 to 10 miles wide, with bold shores. The depths quickly increase on each side, from 12 to 40 and 50 fathoms; the greatest depth being near the north end of Manan, where are from 50 to 55. This is considered by many to be the best and safest passage up the Bay of Fundy, as it is the most advantageous with the prevalent winds, which are from the westward.

PASSAMAQUODDY BAY lies northward of Grand Manan Island, and is an extensive bay, having over its surface a depth of 14 to 17 fathoms water. Before its entrance are a number of islands and detached rocky dangers, among which there are generally passages, deep enough for the largest vessels, but, as these passages are intricate, no vessel ought to attempt to run through them without the assistance of a pilot. The principal of these islands are named Campobello, Moose, Indian, Deer, Pendleton, and Macmaster, the larger of these being Campobello and Deer Islands

The port in the bay most usually frequented by shipping is St. Andrew's, a well-sheltered roadstead, lying at the extremity of a peninsula 5 or 6 miles within the entrance. Various rivers fall into the bay; the Magaguadavic, on its eastern side, is the outlet of Lake Utopia, and the St. Croix, on its western side, is deep enough for moderate-sized vessels; but, as there are some rocks about half-way up, the navigation requires care. At its head the St. Croix River divides into two streams, that to the northward taking the name of Oak Bay.

Passamaquoddy Bay with the Chapeneticook, or River St. Croix, divides the British American territory from that of the United States. In November, 1817, the commissioners appointed by the respective governments, under the treaty of Ghent (the last treaty of peace), decided that Moose, Dudley, and Frederick Islands, in the Bay of Passamaquoddy, should belong to the United States; and that all the other islands in the same bay, with Grand Manan, in the Bay of Fundy, should belong to Great Britain. The citizens of the United States were to continue to enjoy the right of navigating through the Ship Channel, between Deer Island and Campobello; and, of course, through the channel between Moose and Deer Islands.

There are three passages into Passamaquoddy Bay, viz., the Western Passage, Head Harbour Passage, or Ship Channel, and the Letite, or Eastern Passage. The first is that between Campobello and the main land to the S.W.; the Head Harbour Passage lies between Campobello and Deer Island; and the Letite, or Eastern Passage, runs in to the eastward and northward of both Deer and Campobello Islands. The passage usually adopted by British ships is the latter.

The easternmost, and consequently the outermost of the small rocky islets before the entrance to Passamaquoddy Bay, is the White Horse, which appears at a distance like a white rock, but is really a small islet, barren and destitute of trees, while the islets about it are covered with them; it, therefore, serves as a beacon. Close-to all round it is deep water of 11 to 20 fathoms.

Campobello Island, on the south side of the entrance to Passamaquoddy Bay, is about 7½ miles long in a N.E. by N. direction, and 2 miles broad. It has a very irregular shape, and its eastern side is bold, there being 20 fathoms at ½ a mile off, which deepens rapidly as you recede from the land. The southern end of the island is separated from Quoddy Head by a narrow rocky channel, in which the water is too little to allow any but the very smallest vessels to pass; vessels therefore usually go north of the island when entering the bay.

At the north end of Campobello Island, just under the lighthouse, there is a little harbour, named Head Harbour, in which the small coasting vessels sometimes find shelter. In it there are 10 to 3 fathoms, and when within, protection is afforded by an island from easterly winds. The bottom is said to consist of mud.

The lighthouse on the north-east end of Campobello Island is painted white with a red cross on it; it is 34 feet high, and shows a fixed light at 64 feet above the sea, visible 15 miles.

On the west side of Campobello is the harbour of De Lute, a fine anchorage for vessels, having at its south-west end a place named Snug Cove. Moose Island, on the opposite side of the channel, belongs to the United States, and British vessels are not allowed to ride there above 6 hours at any one time. A ship of 500 tons may ride, moored head and stern, in a fine cove at the south end of this island, safe from all winds, but the anchors are very much exposed with winds from the east.

Quoddy Head is of moderate height, and has a lighthouse upon it 55 feet high, showing a fixed light at 133 feet above the sea, visible 17 miles. The position of the building is in lat. 44° 49′ N., and long. 66° 57′ W., and as it is painted red and white in horizontal stripes, it appears very conspicuous when making Passamaquoddy Bay from the southward or westward.

At about a quarter of a mile without Quoddy Head lie two remarkable rocks, named the Sail Rocks, which, at a distance, resemble a ship; to the eastward of these there is a whirlpool. In passing it is requisite to give these objects a berth of half or three-quarters of a mile before you haul in.

Deer Island, within Campobello, is about 6½ miles long, and 2½ miles broad, and has an irregular shore, containing several small harbours. Off its north end are a number of little islets, which form with the eastern coast the channel into Passamaquoddy Bay, named the Letite Passage. This island, with the islets about it, gives such protection to Passamaquoddy Bay from the southward, that it may be considered as perfectly land-locked.

ST. ANDREW'S HARBOUR lies on the eastern side of the River St. Croix, and is formed by a small island named Navy Island, lying off the town, which protects the roadstead from the south-westward. The town is a pleasant little place, and the harbour being good, is much visited by vessels for the purpose of loading timber, which is longer, and said to be of a better description than that of Nova Scotia. The merchants of this town also load timber at other places, at Oak Bay, in the St. Croix River, and at Bocabec, Digdeguash, and Magaguadavic in the north-eastern part of Passamaquoddy Bay, all of which are excellent harbours.

Navy Island is pretty bold-to on the south-western side, but shingly flats extend off it towards the town, and nearly join the flats from the main shore, there being only a very narrow passage between at low water. The channel to the north-westward of the island is very narrow at low tide, the flats nearly joining; but at high water, spring-tides, there is a depth of 18 to 24 feet. The channel to the eastward of the island is considered to be the best, and it has been well buoyed and marked; at the narrowest part of the channel is a lighthouse on the town side, which shows a fixed light at 35 feet: here the channel is only 20 fathoms wide, and has a depth at low water of 8 to 14 feet.

St. Andrew's Lighthouse, according to Lieut. Kortright's (R.N.) survey in 1844, stands in lat. 45° 4′ 10″ N., and long. 67° 3′ 48″ W. It is high water, on the days of full and change, at 10h. 50m.; springs rise 24 to 26 feet, and neaps 20 to 22 feet. Variation of the compass 15° 33′ W.

CHAMCOOK HARBOUR, 3½ miles to the northward of St. Andrew's, is one of the best harbours in Passamaquoddy Bay; indeed, in some respects, it is considered preferable to St. Andrew's, there being more water, and a greater extent of anchorage. Before it there is a large island named Minister Island, which at its southern extremity is connected to the shore by a bar, dry at low water. The entrance to the harbour is therefore round the north end of Minister Island, through the narrow channel which that end of the island forms with the shore. This channel is rocky on either side, and we believe is buoyed; in it there is a good depth of water for vessels of a moderate size. When within the entrance you may anchor in 6 to 8 fathoms, and be perfectly sheltered from all winds. At the head of the harbour there is a wet dock.

In Bocabec Bay, northward of Chamcook Harbour, there is a depth of 9 to 7 fathoms, and protection is afforded to the southward by two small islands, named Hardwood and Hospital Islets. These islands are surrounded for a short distance by a shallow flat, and are connected to each other by a rocky ledge; on their northern side small vessels occasionally anchor in 6 fathoms.

To the eastward of Bocabec Bay are Bocabec and Digdeguash Rivers, having at their entrance a number of small islets.

DIRECTIONS.—To run into Passamaquoddy Bay a stranger must always take a pilot, as the many rocky islets at the entrance make the navigation intricate and dangerous without the assistance of local knowledge.

The Western Passage, between Campobello and Quoddy Head, is at its entrance about a mile wide; but the passage gradually narrows to the W.N.W., and N.N.W., and at 2 miles up a rocky bar stretches across, which in parts becomes dry at low water. At rather more than a mile within the entrance, you may come to anchor in 5 to 3 fathoms, well sheltered, either by day or night, and can wait for a pilot, who may be obtained, on firing a gun and making the usual signal; the pilot will take the ship to Snug Cove or Moose Island, whence another may be obtained for St. Andrew's, the Rivers St. Croix, Magaguadavic, &c.

Large ships, bound into the bay, should pass to the eastward of Campobello, steering N.E. by E. and N.E. towards the Wolves, which lie about 6½ miles eastward from the northern part of Campobello. So soon as the passage between Campobello and the White Horse bears W.N.W., steer for it, leaving the White Horse on your starboard side, and keeping Campobello nearest on board. You will now, proceeding south-westward through the Ship Channel, leave a group of islands on your starboard side, and will next see Harbour De Lute, above-mentioned.

Between the Wolves and the north end of Campobello there is a depth of from 60 to 100 fathoms. With the latter bearing S.S.E., or S.E., there is a depth of 19 and 20 fathoms, where ships may anchor securely from all winds. The courses thence to Moose Island are S.W. by W. ½ W. and S.W. 5 miles.

If bound from Moose Island up the River St. Croix or Scoodic, as you pass Bald

Head, opposite Deer Island, give it a berth of half a mile, as a ledge of rocks lies off it. Having passed this point, the course and distance to Oak Point, or Devil's Head, will be about N. by W., 4 leagues; the latter may be seen from the distance of 10 or 12 miles. On this course you will leave to port Fross Ledge, three-quarters of a mile from land, and 6 miles from Bald Head. In the upward course from this, there are some shoal parts, which may be avoided by the lead.

TIDES.—Common tides, within the southern passage of Passamaquoddy Bay, rise about 20 feet. At Welsh Pool, in Campobello Island, the tide flows at 10h. 57m., full and change; and runs, when strongest, between Moose Island and Marble Island, and between Deer Island and Campobello, nearly 5 miles an hour. In the Bay, the stream of tide is scarcely perceptible. It is high water on the eastern side of Grand Manan at 10h.; springs rise 25 and 20 feet.

GENERAL REMARKS

ON

THE NAVIGATION OF THE BAY OF FUNDY.

SHIPS navigating the Bay of Fundy have to encounter an atmosphere almost constantly enveloped in thick fogs, tides setting with great rapidity over the rocks and shoals with which it abounds, and a difficulty of obtaining anchorage on account of the depth of water; so that, under these circumstances, the greatest attention is requisite, in order to prevent the disastrous consequences which must necessarily attend a want of knowledge and caution.

When off Cape Sable, with a westerly wind, and destined for the Bay, it is best to make the coast of the United States, about the Skuttock Hills and Little Manan Lighthouse,* as you can pass with greater safety to the westward of Grand Manan than to the eastward, and can have shelter, if required, in the several harbours of that coast.

Between Grand Manan and the coast of Maine the passage is free from danger; vessels beating through, generally stand from side to side, particularly in fogs, the depth being from 12 to 50 fathoms, with a bold shore on each side, and the tide through regular and strong. The Wolf Islands may be passed on either side, as there is deep water close-to; but they afford no sheltered anchorage, except for small fishing vessels in summer time. With light winds, a lee tide, or thick weather, you may let go an anchor anywhere between the Wolf Islands and Beaver Harbour, in good holding ground, in a depth of 20 or 25 fathoms. Point Lepreau is bold-to, and was formerly considered dangerous in dark weather, as it projects so far into the sea, but its light-house, with double lights, is now an excellent guide. Hence to St. John's the course is free from danger.

When steering between Grand Manan and Bryer's Island, the utmost caution is requisite during thick weather, as vessels are frequently drawn amongst the islands and ledges to the southward of Manan by the flood setting directly on them: the most dangerous is the Old Proprietor (see page 47), which, at low water, is uncovered for the space of half an acre. When the wind, therefore, veers at all to the southward, make the best of your way to St. John's Harbour, or you may secure an anchorage in Grand Passage or St. Mary's Bay, as it seldom blows in that direction above 18 hours without bringing on a fog.

The prevailing winds here, and on all the coast of Nova Scotia, are from W.S.W. to S.W. nearly as steady as trade-winds; excepting that during the summer months they are rather more southerly, and accompanied, with but little intermission, by fog, which requires a north-westerly wind to disperse it. It is, therefore, recommended not to leave an anchorage without making arrangements for reaching another before dark, or the appearance of a fog coming on, which with a S.W. wind is so sudden, that you are

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* Little or Petit Manan Lighthouse exhibits a fixed light, varied by flashes every two minutes: lat. 44° 22′ N., long. 67° 52′ W.

unawares enveloped in it; nor to keep at sea during the night, if it can be avoided. Whenever the wind blows directly off the land, the fog is soon dispersed.

The tides are very rapid, but regular; and although the wind against them alters the direction of the rippling, and sometimes makes it dangerous, it has little or no effect upon their courses. The flood sets from Cape Sable to the north-westward through the Seal Island and Bald Tusket Passages, at two or three knots in the hour; after which its rate increases to 4 or 5 knots; thence taking the direction of the shore, it flows past Cape St. Mary, and then N.N.W. towards Bryer's Island: it sets but slowly up the extensive Bay of St. Mary, which adds to its strength along the eastern shore; then increasing its rapidity as the Bay of Fundy contracts, it rushes in a bore into the Basin of Mines and up Chignecto Bay. Between Bryer's Island and the opposite northern coast, and for some distance up the Bay of Fundy to the eastward, the first of the flood sets strong to the northward (nearly North); so that it will be extremely dangerous for a vessel to run in the night or thick weather, from any part of the southern to the northern coast, without making a large allowance for the set of the tide, and keeping the lead constantly going.

The following note on the Navigation of the Bay of Fundy is by Com. W. Peel, H.M.S. *Daring*:—

"The prevailing winds in this Bay during the months of July, August, and September are from S.E. and S.S.W., which roll in before them a dense wall of fog that penetrates everywhere, and which is only occasionally lifted by a change of wind from the northward.

The navigation, therefore, during this period, particularly in the month of August, requires great firmness and caution, but is far from being so dangerous as represented. Unfortunately, from the short summer of the climate, and long severity of winter, the whole activity of trade is compressed into this brief period.

The northern shore of the Bay of Fundy is clear and bold-to, in its whole extent, with several beautiful harbours, and a safe deep passage between it and Grand Manan Island, whilst the Wolf Islands, or the very remarkable rock named the 'White Horse,' are a guide against being carried by the tide into the channels that open the Passamaquoddy Waters. A ship, therefore, may with proper precautions navigate along the shore in perfect safety. It is the passage between Grand Manan Island and the Nova Scotia shore that is really dangerous, but here no ship should attempt to pass without the prospect of clear weather. She may anchor in Bryer's Island Passage, if coming from the northward, or in St. Mary's Bay, if from the south, until an opportunity occurs. To pass through the passage formed by Bryer's Island would at once clear everything; but the tide runs through with great rapidity, and breaks across in a heavy ripple. A rock also exists in the channel, the position of which is not generally known. The *Daring* attempted once to beat through, but the pilot had mistaken the time of the tide, and when half way, losing his nerve, he gave up charge. I have no doubt, however, but that it would be of great service to the commerce of St. John's, New Brunswick, to have attention drawn to this passage, as the means of clearing the dangers outside; for there is this other advantage in standing close in to the Nova Scotia shore, which is the reverse on the other side of the bay, that the fog seldom comes close home. For this reason, and also on account of the Bank of Soundings, in coming from the eastward into the Bay of Fundy, I would prefer coming up by the Nova Scotia shore, to standing across for the other side, as recommended in the General Directions.

The tides in the Bay of Fundy, though extremely rapid, are very regular, and the wind, during these months, seldom blows with violence, or without dispersing the fog in the immediate vicinity of land. The water, also, in the bay above Grand Manan, is smooth, though rendered dangerous to boats in many places from the rippling of the tides.

I will not attempt to describe the several harbours that the *Daring* visited. A pilot is necessary for a first acquaintance; but nowhere better than in the Bay of Fundy, from the vivid recollection of the land, that is impressed upon the mind by anxious attention, can one so quickly learn to dispense with his services.

I would recommend a ship stationed in the Bay of Fundy to make Digby, in the Basin of Annapolis, her chief resort. A ship's company can here have liberty without being exposed to the great bribes for desertion offered at St. John's; fresh provisions are cheap and excellent, and water can easily be obtained by the ship's boats without

having to purchase it, as at the former place. The Basin of Annapolis also is more free from fog than any other place, and the entrance is wide enough for a ship to work through."—*Nautical Magazine, December*, 1848.

The following remarks on the "Passage into the Bay of Fundy" are by Mr. R. Leighton, master of the barque *Royal Adelaide*:—

"Our Directions recommend ships bound to the bay to make the Skuttock Hills upon the United States' coast, and enter by the Grand Manan channel; one side of which is formed by the main land, and its approach is facilitated by lights and soundings. Where the shores are not bold, and the lead a good guide, the dangers are pointed out by lighthouses in clear weather, and fog signals when it is thick: thus the danger from fogs in this channel is much lessened, and as the assistance of St. Andrew's pilots is generally procurable here, with this local aid detention seldom occurs, when bound to St. Andrew's.

The tides in this channel are regular, and by using it you avoid, by closing with the main land, the rapid tides setting upon Grand Manan and its ledges both ways. It is allowed to be the best channel *into* the bay, but it is not much used by St. John's ships. The reasons which they assign are, chiefly, that within the bay the channel for them is on the wrong side. They first object to running to leeward when approaching the bay with north-easterly winds, which occasionally continue a considerable time, and they hold to the weather shore, making the Nova Scotia Banks of Soundings a check in making Bryer's Island; but this is an isolated point, being divided from the main land by St. Mary's Bay, and the guides in approaching it are not equal to those on the other side.

In the channel there is a ledge upon Bryer's Island side and the Old Proprietor (see pages 36 and 47), forming the long projecting point of the Grand Manan Ledges, and they not being indicated by beacons or lighthouses, render this channel dangerous; the banks are too steep to render soundings a good guide; and the marks upon Grand Manan frequently, even in fine weather, cannot be made out, and there are no guns, or gongs, when you meet with a thick fog.* But this passage, with all its faults, is generally used to St. John's, because the Nova Scotia side of the bay is more bold and straight than the other, and the tides more regular; so that in thick weather their effects can be better calculated, whilst upon the other side the freshets, in that season, cause a superficial current, which both upsets any calculation of the tides, and renders the log useless; and, in the lower parts, the rapid tides setting upon Grand Manan render the calm almost as dangerous as the gale in thick weather.

But however you may avoid tides and currents bound to St. John's, there is no avoiding the dense fogs of the Bay of Fundy; and, in this respect, the position of St. Andrew's gives it a great advantage. It is known that upon the American coasts it is, frequently, a thick fog over the sea, while the land is clear, particularly if the wind be not blowing directly upon the coast; and provided that soundings give sufficient warning, and the wind admits of hauling off, the land may often be approached by the lead, and your position ascertained or even your port gained.

Whilst the Bay of Fundy is full of dense fog, St. Andrew's Bay, with the islands forming it, and the channels between them, may be all fine and clear. I have laid wind-bound upon Bar Island reef for four days, with the winds south, and south-easterly, and the edge of a dense fog in the bay, running along from Head Harbour to Wolf Islands, while we had fine, clear weather; and ships coming through the Grand Manan channel, and bound to St. Andrew's, emerging from the fog, like coming through a door in a wall, and finishing their passage in similar fine clear weather; but those bound to St. John's must still contend with that formidable danger to this navigation.

The freshets in the spring of the year, the nearness of the Falls to the town of St. John's, throwing so large a volume of water into that harbour, and the tortuous points of the river, render the current so strong, and produce such whirling eddies, that but a small portion of the river is available for ships to anchor in; and with strong southerly winds a strong lipper comes into the harbour, and their roadstead also is open to this wind. But whatever natural defects the harbour may have, or whatever obstructions there may be to the navigation in reaching it, the skill and energy of its inhabitants are undoubted; and all must admire the fine model of their ships, and their admirable combination of sailing and carrying qualities. But nature

* *Vide* description of Machias Seal Island and Gannet Rock lighthouses, pages 47 to 49.

has been more favourable to St. Andrew's; her capacious land-locked bay guards her fine anchorages. St. Andrew's is a fine harbour, but the anchorage in the stream is rather small, and some of the wharves are dry at low water, but have a fine gravel bottom.

Chamcook is the best natural harbour that I have ever seen, and I think may challenge comparison with any in the world. It is completely land-locked, and although it has a rise and fall of 30 feet, yet it is nearly tideless; the high bar of Minister Island, which connects that island to the main land, only overflowing at high tide. Minister Island forms the outer boundary of the harbour, leaving the entrance rather narrow, having a spit from each point (as there are from all points), but quite safe. They would only require a beacon on them; the anchorage is large, and good holding-ground. I found the bottom foul within 3 fathoms at low water, but a fine line of tidal wharves might be constructed upon the sides of the creek, which brings down the water from a lake at a considerable elevation above the tidal level, and which passes through the saw-mill dam. I beg the worthy proprietor's pardon, I should have said that the lake was a reservoir and sluice to the *first* float *dock* in British North America. Nature has in those respects been more favourable to St. Andrew's than to St. John's, and now that it is to be the terminus of the great North American railway, there is a great field open for the skill and energy of her inhabitants to raise her to a flourishing condition; and it is to be hoped that the results of that great work may be good and widely spread, and facilitate both commercial and social improvements in extension."—*Nautical Magazine*, 1849, page 248.

PASSAMAQUODDY BAY TO CAPE ELIZABETH.

THE most remarkable elevations of land between Passamaquoddy Bay and Cape Elizabeth are the Skuttock and Mount Desert Hills and the Hills of Penobscot. The Skuttock Hills are five in number, and at a distance appear of a round form; they lie to the N.N.E. of the Port of Goldsborough, and are readily distinguishable from any hills to the eastward. The Mount Desert Hills may, in clear weather, be seen from a distance of 15 to 20 leagues. The Penobscot Hills can be seen over the Fox Islands, when bearing from N.W. to N.N.W. When within 4 or 5 leagues of the Mount Desert Hills, the Skuttock Hills will bear about N.N.E.

When approaching the land from the southward and eastward, the first object seen will probably be the *Mount Desert Rock*, as it is the outermost rocky islet off the coast of Maine, and is readily distinguished by its lighthouse. The rock itself is small, but the lighthouse being 60 feet high, will be sufficiently apparent; it is of a grey colour, and shows a fixed light at 75 feet above the sea, visible 14 miles in clear weather.* The bearing of the rock from the lighthouse on Baker's Island, at the entrance of Mount Desert Harbour, is said to be S. 12° W. about 15 miles.

Near Mount Desert Rock, at the distance from it of 3,614 feet in a S.W. by S. direction, there is a ledge of 3 fathoms, named the Columbia Ledge, from the ship commanded by Captain Owen, R.N., who discovered it. Close to it, inside, are said to be 22 fathoms, and outside from 17 to 30 fathoms.

At the Mount Desert Rock, the stream of flood divides, and runs eastward and westward. With the Skuttock Hills bearing N.N.E., and within the distance of 5 leagues of those of Mount Desert, the tide of flood sets E.N.E., and the ebb W.S.W.; but at 9 or 10 leagues from the land, the current, in general, sets to the S.W. and more westward. From the Mount Desert Rock to the Fox Islands the flood-stream sets W.S.W. along the shore; but it still runs up to the northward into Blue Hill Sound, Isle-au-Haut Bay, &c.

LITTLE RIVER.—This harbour lies about 15 miles south-westward from Quoddy Head, and nearly due west from the middle of Grand Manan Island; it is the first harbour met with after leaving Passamaquoddy Bay, the inlets forming Baylis Mistake, Haycock Harbour, and Moose Cove, being of no value to shipping. The harbour requires a pilot to assist you to enter, and it is said that the entrance cannot be seen until you approach the northern shore, and that you should not run for it before it bears N.W. or N.N.W. There is a bluff point of rocks on the starboard hand, going in,

* A fog-bell is attached to this lighthouse.

and an island in the middle of the harbour. In entering, leave the island on your port side, and when you have passed it half a mile, you may anchor in 4 or 5 fathoms, muddy bottom, and be protected from all winds. The land between this harbour and Quoddy Head trends N.E. by E. ½ E., above 4 leagues.

As a guide to assist vessels in making Little River Harbour, a small light flashing every 1½′ is shown from the island at the entrance, at 40 feet above the sea level, which is visible about 10 miles.

MACHIAS BAYS.—There are two bays lying to the westward of Little River Harbour, of which the larger is the westernmost. The Great Machias Bay is about 5 miles in extent, and has at its head the town of Machias, situated at the junction of two streams, named the East and West Rivers. The assistance of a pilot is necessary to enable a stranger to enter either bay.

LITTLE MACHIAS BAY.—The entrance to this bay is about 2 miles to the westward of Little River Harbour, and has before it a number of small islets, about which there may be unseen dangers, so that they must be cautiously approached. These islets lie nearly in the middle of the entrance, and are said to have 8 and 12 fathoms close to them. When within, the bay has a N.N.W. ½ N. direction, and we believe possesses good anchorage on the port side, in a depth of 5 to 2 fathoms, but open to the south-eastward.

At a short distance from the west side of Little Machias Bay is an island 2 miles in extent, named Cross Island. This island lies on the east side of Great Machias Bay, and is separated from the shore by a narrow passage, in which are said to be 4 and 1½ fathoms; but it would not be prudent for a vessel to attempt to run through without the assistance of local knowledge, as the channel has rocks in it.

GREAT MACHIAS BAY.—The entrance to this bay bears N.W. ½ W., 14 leagues, from Bryer's Island Lighthouse; N.W. by W. ½ W., 22 miles, from Gannet Rock Lighthouse; and N.W. ½ W., 10½ miles, from the lighthouses on the Machias Seal Isle. The Machias Seal Isle and Gannet Rock are nearly true East and West from each other, at the distance of about 14 miles, and several dangerous ledges lie between them.*

Directly fronting the entrance of Great Machias Bay, within the distance of a league, are two small islets named the *Libbee* or Liby Isles, on the southernmost of which is a lighthouse coloured grey, 35 feet high, exhibiting a fixed light at 52 feet above the sea, visible 12 to 15 miles. Attached to the building is a fog-bell, which is rung in misty weather. At a league N.E. ½ N., from this lighthouse is the S.W. end of Cross Island, previously mentioned.

In sailing for this bay from the Seal Islands, and steering N.W. ½ W., you will gain sight of the Libbee Isles' Lighthouse, which is to be left on the port side: rounding these isles you thence proceed North into the bay, taking care to avoid the ledge running off 1½ mile from the south-west end of Cross Island. On this course you will leave on the port side a large white rock, named the Channel Rock; and, unless bound upward into Machias Harbour, you may haul to the westward. When you have advanced half a mile above this rock, bring a high round island, covered with trees, to bear North, when you may anchor in 4 or 5 fathoms, muddy bottom; but should you intend to go up to the town of Machias, keep on a north course, until you have advanced above a high round island on your port hand; you then steer W.N.W. or N.W. by W., for a point covered with birch-trees, and having a house on it. On the starboard hand there are flats and shoals. You may keep on the port hand after you pass this house, until the river opens to the northward, when you may run up to Cross River, and anchor in 4 fathoms.

From Machias Bays westward as far as Goldsborough, a distance of about 35 miles, the coast is so intricate and studded with such a multitude of islands and rocks, that no description we could give of it would be of service. It has as yet been but indifferently surveyed, and our knowledge of its dangers is still very imperfect, so that vessels when sailing along or visiting its harbours will do well to use extra caution. In succession are passed the harbours of Buck's, Little Kennebec River, Englishman's Bay, Moose-a-beck Beach, Indian River, Pleasant River, Narraguagus Bay,† Dyer's Bay, &c., in several of which vessels may anchor in the greatest security, but the access to them is too difficult for strangers to attempt. In sailing along after quitting Machias

* It is intended to erect a lighthouse on Round Island, in Machias Bay.

† On the south-eastern point of Pond Island, Narraguagus Bay, there is a red building 29 feet high, which shows a fixed light at 45 feet above the sea, visible 12 miles.

Bays, you first pass the Libbee Islands, then Head Harbour Island, the Wass Islands, Nashes Island, and afterwards Petit Manan Island. The course and distance from off the Libbee Islands to a berth off the Great Wass Island are about S.W. by W., 10 miles, and from the latter to the Little Manan Isle W. by S., 13½ miles.

The first lighthouse met with after passing that of the Libbee Islands, is one erected on Head Harbour or *Mistake Island*, off Moose Peake Beach. It is a white building 40 feet high, exhibiting a light flashing every 30″, at 65 feet above the sea, visible about 14 miles.

On *Nashes Island*, at the east side of the entrance to Pleasant River, there is a lighthouse, showing a fixed flashing light of a red colour, at 47 feet above the mean level of the sea, visible 12 miles in clear weather. From this light Black Rock, which is always above water, bears S.E. by S. ½ S., 3½ miles, and Jourdan's Outer Ledge, which is covered at high water, S.W. by W. ½ W., four miles.

On the south end of *Petit Manan Island* there is a lighthouse 109 feet high, which shows a fixed light, flashing every 2′ at 125 feet above the sea, visible about 17 miles. In the vicinity of this lighthouse there are many dangerous ledges, extending from it from 2 to 5 miles. We believe that a fog-bell has lately been attached to this lighthouse, which is sounded in thick weather every 20″.

Petit Manan Island is almost connected to the shore by a ledge which dries at low water. From the lighthouse Moulton's Ledge, which dries at low tide, bears W. by N., distant 4 miles; Jackson's Ledge, or Eastern Rock, on which there are 12 feet at low water, bears East, 4 miles; the S.E. Rock, on which are 7 feet, bears S.E. by S., 4 miles; and a ledge of 16 feet S.S.E., 2 miles.

In steering from Petit Manan Island to a berth off the Great Wass Island, already noticed, the course and distance are E. by N., 13½ miles; and from the latter to the Libbee Lighthouse, off Machias Bay, N.E. by E. 10 miles.

GOLDSBOROUGH HARBOUR.—To run into Goldsborough a stranger ought to have the assistance of a pilot. The Skuttock Hills, previously mentioned as lying to the N.N.E. of the harbour, form a good mark in running for the entrance, as by bringing them in that direction, and steering on that course, you will, on approaching the harbour, see the Petit Manan Lighthouse, which should be left on the starboard hand. This lighthouse stands at about a league to the southward of the point between Dyer's Bay and Pigeon Hill Bay. At the entrance to the harbour there is an islet covered with trees on the eastern and two on the western side. Within the entrance the harbour is a mile wide, and you may anchor in from 4 to 6 fathoms, where you please. The course in is N.N.W. 1½ mile, then N. ½ E., 4 miles, when you may anchor in 3 to 4 fathoms, safe from all winds, on a muddy bottom.

PLEASANT RIVER.—This river lies eastward of Goldsborough, and equally with that harbour requires the assistance of a pilot to carry you in, as it would be exceedingly imprudent for a stranger to attempt to run in without. When coming from the westward, you leave Petit Manan Island on the port hand at the distance of about ½ a mile, and in passing it must pay particular attention to the rocks and ledges scattered about in its vicinity; steer then about N.E. 1½ miles, and it will carry you up with Nashes Island, which you must leave on your starboard hand, at the distance of ¼ of a mile. The course then is N.E. by E., 2½ miles, into Tibbett's Narrows—a narrow channel ¼ of a mile wide, formed by Tibbett's Island on the N.W. side, and on the S.E. side by Ram Island. By steering N.E. ½ E., one mile from the middle of these Narrows, you will reach Shabby Island, which you leave on your starboard hand at the distance of one-eighth of a mile; and when ½ a mile above it may anchor in from 5 to 6 fathoms, good holding-ground, Shabby Island bearing S.W. by S.

Coming in from sea, and eastward of all the shoals and ledges, bring Nashes Island Light to bear N. by W., and run up for it, taking care not to approach the southern end of the island nearer than half a mile, as there is a sunken ledge fully one-third of a mile from the shore. It is necessary to be careful when entering, as the river has not been surveyed.

DYER'S BAY.—Immediately eastward of the entrance to Goldsborough Harbour is Dyer's Bay, which may be entered by giving Petit Manan Island a berth of half a mile, leaving it on the starboard hand. If you bring the light to bear N.E., at three-quarters of a mile, a N. by W. course will carry you into the mouth of the bay, leaving a large dry ledge on the port hand; when abreast of this ledge, which is bold-to, give it a berth of 15 or 16 fathoms, then steer N. ½ E., about 4 miles, for a berth, where you may anchor, safe from all winds, in 4 or 5 fathoms, muddy bottom.

BOWBEAR HARBOUR lies close to Dyer's Bay, and with that bay must be entered by the assistance of a pilot. In approaching from the westward, and bound for Pigeon Hill or Bowbear Harbour, bring Petit Manan light to bear N.E., and run for it, giving it a berth of a quarter of a mile, and then steer N. ½ W., about 4 miles. In steering this course you will leave the Egg Rock on your starboard hand, when you will make the westerly shore, giving it a berth of half a mile; then steer N.N.E., a mile, when you will be opposite Dyer's House, and may anchor, in 3 fathoms, safe from all winds.

Prospect Harbour, westward of Goldsborough, is frequented principally by the coasters.

MOUNT DESERT ISLAND is a large island of about 10 miles in extent, which may be easily recognised by the hills upon it. On its southern side there is a deep inlet, named Soames Sound, at the head of which is the small village of Eden. This inlet has several islets at its entrance, which make the approach rather difficult; but when within there is said to be a depth of 7 to 4 fathoms. The names of the islands before the Sound are the Great and Little Cranberries, Sutton's and Bear Islands. At the entrance to the Sound are two good harbours, called the North-east and South-west Harbours, the approach to which should always be made with the assistance of a pilot, as the navigation is intricate, and the harbours have not been surveyed.

Bear Island is a small island covered with spruce trees, lying nearly in the centre of the passage between Sutton's and Mount Desert Islands. It has a lighthouse of red brick upon its western end, which shows a fixed white light at 97 feet above the sea, visible 15 miles in clear weather. From Baker's Island Light, this light bears about N.W. by N., distant 5½ miles; monument on Bunker's Dry Ledge, W. by N. ½ N., 2¼ miles; Granite Ledge, (8 feet at low water,) W. ½ N., one mile; outer end of Long Ledge, N.E. ¾ N., 4½ miles; north-west point of Cranberry Island, N. by E. ½ E., 4 miles; and Flynn's Ledge, N.E. by N., 3 miles.

Baker's Island and Cranberry Island form the western side of the entrance of the passage to Bear Island, and are covered with spruce trees. *Baker's Island Light*, situated near the centre of the island, is elevated 105 feet above the level of the sea, and exhibits a fixed light, flashing every 1′ 30″, visible, in clear weather, at the distance of 17 miles. A fog bell is struck by machinery once every 12 seconds during thick and foggy weather.

MOUNT DESERT EASTERN PASS.—When approaching from the westward, and bound into Mount Desert, bring Baker's Island Light to bear North, and run for it, leaving it on your port hand. After passing it, steer N.N.W. until the light on Bear Island bears W.N.W., and run direct for it. In running this course you will pass Sutton's Island on your port hand: its shores are very bold, and you may approach them to within one cable's length; this island lies near the centre of the passage, but the best water is to the northward of it. If, however, you are desirous of going to the westward of it, when between Bunker's Ledge and Cranberry Island, steer W. by S. until Sutton's Island eastern point bears N.E.; you may then anchor, or run farther in, into Hadlock's Harbour, to the south of you, or steer W.N.W., about 3 miles for S.W. Harbour.

Bunker's Ledge, on which is a stone beacon with a cask placed on a staff in its centre, bears from the eastern end of Sutton's Island, E. ½ N., about a mile; this ledge you leave on your starboard hand. When approaching the ledge, you can do so to within 2 cables' lengths. When the light on Baker's Island is entirely obscured behind the eastern point of Cranberry Island, you are then westward of Bunker's Ledge; and if you have a head wind, may run to the northward until the light on Bear Island bears W. by N.

In running for Bear Island Light, you may approach Bunker's Ledge, to within a cable's length, leaving it on your starboard hand, and after passing the light about a quarter of a mile, may anchor in 12 fathoms water, with the light bearing from East to E.N.E., good holding-ground; or you may run for N.E. Harbour, about a mile to the northward of the light. About half a mile to the N.W. by W. of Bear Island Light there is a *ledge*, bare at low water, having on its western edge a spar-buoy, painted black, which you leave on your starboard hand; this ledge bears from the centre of N.E. Harbour S. ½ W.

Bunker's Ledge bears from Baker's Island Light N. by W., distant about 4 miles. Bear Island Light bears from Bunker's Ledge, W. by N. ½ N., distant about 3 miles. The middle of Cranberry Island bears from Bunker's Ledge S.S.W., distant 1¼ mile.

Baker's Island and Cranberry Island, as before stated, form the western side of the entrance of the passage to Bear Island. A bar extends from Baker's Island to Cranberry Island, which is covered at high water; this opening is often mistaken by strangers for the passage into Cranberry Island Harbour. You must always recollect, that before entering Cranberry Island Harbour, the light on Baker's Island will be entirely obscured behind the eastern point of Cranberry Island. You may go in on either side of Bunker's Ledge, but strangers should leave it on the starboard hand. Between Herring Cove and Bear Island Light, near the north shore, are several rocks and ledges, covered at high water.

THE S.W. HARBOUR OF MOUNT DESERT.—This is one of the best harbours on the coast, as it will accommodate a large number of vessels, as many as 400 having been at anchor here at one time. To run in, if coming from the westward, when up with Long Island, steer N.N.E., 6 miles, leaving the Two Duck Islands on your starboard, and the Three Calf Islands on your port hand; this course will bring you up midway between the Great Cranberry Island and Mount Desert: you now steer up midway, until you open S.W. Harbour, when you may haul in N.W. or W.N.W., keeping nearest the starboard hand, on account of a ledge on the port hand, which runs off half a mile, and anchor, in 5 or 6 fathoms, muddy bottom, safe from all winds. It is high water here at 12h., the rise of tide being about 12 feet.

Off the S.W. point of Cranberry Island, there is a rock bearing from it about West, distant $\frac{3}{4}$ of a mile. The eastern passage into South-west Harbour is situated between Bear Island and Sutton's Island, after having passed which you may run for the harbour according to the above instructions.

FRENCHMAN BAY lies on the east side of Mount Desert Island, and is a large inlet containing a number of islands. In it are the harbours of Mosquito and Winter,* Flander's Bay, Taunton and Skilling Rivers, and the town of Sullivan, which we believe afford moderate accommodation to small vessels. The access to this bay has been represented as difficult without the assistance of local knowledge. It has not yet been examined, and we possess no information of it which we could depend upon as accurate.

BASS HARBOUR is a small harbour at the south-west end of Mount Desert Island. It has a bar at the entrance over which only vessels drawing 8 feet can pass at low water. The access is therefore rather difficult, and requires the assistance of local knowledge.†

When you leave this harbour and are bound to the eastward, it is said that you should steer E. by S. till you get up with Baker's Island Light, which lies to the eastward of the Cranberry Islands; then steer E. by N., 4 leagues, to Skuttock Island. When you pass this Island, and are bound to Goldsborough, you must steer N.E. about 5 leagues, and keep that course till you bring Goldsborough harbour to bear N.N.W.; then you must leave three islands on your port and one on your starboard hand, and run into the harbour, where you may anchor in 5 or 6 fathoms, and lie safely from all winds.

BLUE HILL SOUND, to the westward of Mount Desert Island, is the wide inlet into which the Union River falls. Over its surface there are a great number of islands and rocks, so that it is quite impossible for a stranger safely to navigate its waters. The depth of water is, we believe, sufficient for the largest ships, but on account of the intricacy of its channels only the coasters visit it. The principal islands before its entrance are the Ducks Islets, Long, Little and Great Placentia, Marshall's, and Burnt Coat Islands; the outermost of which are the Ducks and Long Islands. The following instructions have been given for this Sound:—"As soon as you are past Long Island, you will open a large Sound to the N.N.W., which course you are to steer 6 or 7 leagues, when you will be up with Robertson's Island, leaving the Ship and Barge on your port hand. Robertson's Island is the only island near that place that has a house upon it. The south part of that island is clear of trees, on which the house stands. When you approach the south part of the island, give it a berth of $\frac{3}{4}$ of a mile, as there are several sunken rocks off the point. When you bring this island from S.W. to N.W., you may anchor in 6 or 7 fathoms water, muddy bottom; but if you are bound to Blue Hill Bay, you may stand to the northward direct

* On the south point of Mark Island, Winter Harbour, there is a small fixed light.

† On the east side of the entrance to Bass Harbour there is a small flashing light of red colour, visible 13 miles.

for the Blue Hills, which you may see 10 or 15 leagues distant. If bound to Union River, you should take a pilot at Robertson's Island, as it is not prudent for a stranger to go further without one."

ISLE-AU-HAUT.—South-westward of Mount Desert is Isle-au-Haut, a remarkable land, composed of high, steep cliffs, which has a large bay on each side of it. On its eastern end there is good landing and anchorage at half a mile off, in 18 fathoms, with the low point bearing N.E. by N., where there is a stream of water falling into the sea. The highest part of the island is in the middle, and presents the appearance of a saddle.*

PENOBSCOT BAY.—This is one of the largest and most important bays in the northern provinces of the United States, and contains the most easily accessible anchorages of the whole coast between Cape Cod and the Bay of Fundy. At the head of the bay is the River Penobscot, which collects its waters in the northern part of the State of Maine, at about 200 miles from the coast: this river runs through several lakes in its course, and afterwards unites with what is named the Eastern Branch, and then taking a southerly direction, it falls into the sea. Near the outlet of the river is the town of Bangor, situated at about 50 miles from the sea, and which is accessible to vessels of about 30 tons burthen.

In Penobscot Bay there are various islands, the principal of which are Long Island, opposite the port of Castine, and the Fox Islands more at the entrance of the bay; this latter group of islands occupies an extent of about 10 miles, and, together with Isle-au-Haut, form what is termed Isle-au-Haut Bay. Outside the entrance of Penobscot Bay are Matinicus, Wooden Ball, Seal, and other islands, the exact locality of which can be best seen by a reference to the chart.

Off the south-western side of Isle-au-Haut is the *Saddle Back Ledge*, a high black rock, somewhat resembling a saddle, on the S.E. end of which is a lighthouse, built of granite, 36 feet high, which shows a fixed light at 51 feet above the sea, visible 13 miles. From this light the south point of Isle-au-Haut bears S.E. by E. $\frac{1}{2}$ E., distant about $2\frac{1}{2}$ miles; Seal Island, S. by W., about 10 miles; Wooden Ball Island, S.W. by S.; Matinicus Island, S.W. $\frac{1}{4}$ W., 12 miles; Brimstone Island, W. $\frac{1}{2}$ N., 2 miles; Little Isle-au-Haut Harbour, N.E. by E. $\frac{1}{2}$ E., 6 miles distant; Eagle Island Light, North, distant about 15 miles; and Fox Island thoroughfare, N. by W., distant about 8 miles. At about 2 miles, N.W. by W., from the light there is a small sunken ledge, which breaks at low tides with a little motion of the sea.

The *Matinicus Islands* lie southward of the Fox Islands, directly before the entrance of Penobscot Bay, and have between them a passage of 30 to 36 fathoms water. To the eastward of these islands, about 6 miles, is the Seal Rock, and between is another rock to the south-eastward. The outermost of the Matinicus group of islands is the Wooden Ball Rock, which is distant 7 miles, N.N.E., from the Matinicus Lighthouse. This group of islands should not be approached closely until surveyed, as there may be some dangers not yet discovered.

On a rock, a little southward of the larger Matinicus Island, there are two fixed lights at 85 and 90 feet above the sea, visible about 15 miles, and also a bell which is struck 10 times in a minute during foggy weather; from these lights Seal Island bears N.E. by N., distant 4 miles. It is said that when you are sailing along the coast in a N.E. and S.W. direction, these lights will appear separate, but when sailing N.N.W. and S.S.E. they appear in one; hence they will be open when you are approaching Penobscot Bay.

ISLE-AU-HAUT BAY.—When making the lighthouse on Saddle Back Ledge, bring it to bear from N.W. by N. to N. by W., and run it close aboard, leaving it on your port hand. If bound up the bay, bring the light to bear South, and steer North for the light on Eagle Island, which you may approach to within one cable's length, by leaving it on your port hand. After passing Eagle Island Light, steer N.N.W., about 8 miles, which course and distance will bring you up with the Channel Rock,† which you leave on your starboard hand. Give it a berth of one-eighth of a mile, and steer N. by E., about 10 miles, for Dice's Head Light. When running this course you will pass Cape Rosier, a high bluff, which you leave on your starboard hand.

* On Spoon Island, one of the small islands off the east side of Isle-au-Haut, a lighthouse is being built.

† The Channel Rock may be known by its being a small rock of a yellowish colour, lying to the westward of a small group of islands; it may at all times be seen above the water.

Westward of the Matinicus Islands are the Green Islands, Metinick, St. George's, and Manheigin Islands, between which are various passages suitable for the coasters, excepting the channel between Green and Metinick Islands, where there is a reef of rocks under water. Upon *Manheigin Island* there is a lighthouse 36 feet high, which exhibits a light revolving every minute, at 175 feet above the sea, visible 19 miles. A fog bell is placed on Manana Island, about one mile westward of the light.

When approaching Manheigin Light you can run close to the island on either side, taking care to go between some dry ledges on the northern side of it. In the island there is a small harbour, open to the S.W., which bears E.N.E. from Seguin Island.

The FOX ISLANDS, as before mentioned, divide the entrance of Penobscot Bay into two parts, the eastern of which is named Isle-au-Haut Bay. On *Brown's Head*, the southern head of the Fox Islands, there is a lighthouse 23 feet high, which shows a fixed light at 39 feet above the sea, visible 12 miles. This lighthouse stands at the distance of 2 rods from the shore, and from it the following observations were taken:—Fiddler's Ledge, a reef above the water at two hours' ebb, bears from it W. ¼ S., distant about 3 miles; Crabtree Ledge, breaking at high water with a little sea, W. by S., about 1½ mile; and the Inner Dog Fish Ledge, S.W., about 3 miles.*

On *Heron Neck*, the south point of Green Island, the southernmost of the Fox Islands, a lighthouse has recently (1854) been erected for the purpose of guiding vessels into Carver's Harbour and Hurricane Sound. The tower is joined to the end of the keeper's dwelling, is constructed of red brick, and has its base at about 68 feet above the level of ordinary high water. The height of the light above the ground is 24 feet, which makes a total height above the sea of 92 feet, so that it ought to be seen at the distance of about 10 miles. The roof of the lantern is coloured black, and the light is a fixed (flashing) red light; it will thus be easily distinguished from other lights in its vicinity. From the building to the east end of Seal Island the bearing and distance are S. by E. ¾ E. 13 miles; west end of Wooden Ball Rock, S. ¾ W., 12 miles; Bay Ledge (3 feet at low water), S. by W. ¼ W., 3⅓ miles; lights on the Matinicus Rock, S. by W. ¼ W., 15 miles; Heron Neck Ledge, dry, S. by W. ⅓ of a mile; west end of Matinicus Island, S.S.W. ½ W., 11 miles; Hurricane or Deadman's Ledge, covered at high water, W. by S., ⅓ a mile; and Saddle Back Lighthouse, E. by S., 7 miles. Between the Heron Neck Ledge and Otter Island, Brimstone Island and Saddle Back Light, the whole distance is full of sunken ledges.

CARVER'S HARBOUR AND HURRICANE SOUND.—To run into these places a stranger ought to have a pilot; but in the event of not obtaining one, then the following instructions, by Captain R. King Porter, may be followed:—

"*Carver's Harbour* is a safe anchorage for vessels drawing 10 feet water, lying about two miles from Heron Neck. To run in, bring the light to bear N.E., and run for it. Deep water exists within a ship's length of the rocks. At half a mile from the light you will pass to the eastward of the Deadman's Ledge, (the Eastern Hurricane Ledge,) dry at low water. One-fourth of a mile, S. by W. from the light, lies Heron Neck Ledge, always above water. Pass between the light and the ledge, (a narrow but deep channel,) and you will open Deep Cave on Green Island: keep on in an easterly direction, giving the different points of Green Island a berth of a cable's length. When up with the S.E. point, you will be near a dry ledge ⅛ of a mile from the point—leave it on the starboard hand: Carver's Harbour will then be in sight, and may be known by the houses around the harbour, bearing N.E. by N., distant one mile. Give the east point of Green Island opposite the first house, a small berth, and run for the harbour, leaving some dry ledges on the starboard hand. Keep nearest the starboard shore, at the entrance of the harbour, to avoid some sunken ledges on the opposite side. Anchor in the middle of the harbour in 10 feet at low water, soft bottom, good holding-ground, and good anchorage.

Hurricane Sound is formed by Green Island, on which the lighthouse stands, on the east, and a range of islands and ledges on the west side, and is a safe roadstead for any class of vessels. To run in, bring Heron Neck Light to bear N.E., and run for it; when half a mile from the light you will pass Deadman's Ledge, which leave on your port hand, and when midway between the ledge and the light you will be in the entrance to Hurricane Sound, which runs in in a northerly direction.

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* Fiddler's Ledge bears from Crabtree Point W.S.W., about ½ a mile; Crabtree Ledge from the same point S.W. by S., about ½ a mile; and the Inner Dog Fish Ledge bears S.S.E. from the Crabtree Ledge, distant about 1½ mile.

Keep midway between Green's Island on the east, and the islands and ledges on the west side, and when about 1½ mile above the entrance you will be near a dry rock: pass to the eastward of it, and anchor when you have room to give the rock a good berth. There is anchorage all the way up the sound, but the water is deep until you get above the rock."

On the western side of the western channel into Penobscot Bay, (the channel formed by the Fox Islands and the western shore,) is *Owl's Head*, on which is a lighthouse 19 feet high, showing a fixed light at 100 feet above the sea, visible 16 miles. Thence in sailing up to Penobscot River, you pass by Camden on the west, and Cape Rosier on the east. Immediately round Owl's Head is a small cove, to sail into which bring a rocky point lying on your starboard hand to bear N.E., and a ledge of rocks without that point to bear E.N.E., and anchor in 4 fathoms. You will lie open to the wind at E. by N. and E.N.E., but with all other winds you are safe. The tide of flood here sets to the eastward, and the tide of ebb S.W. through the Muscle Ridges.

The eastern channel into Penobscot Bay is very intricate. It lies between Isle-au-Haut on the west, and the smaller islands on the east, through the channel named Long Reach, which is formed by the shore of Sedgwick on one side, and Deer Island on the other, until it unites with the main channel, between Cape Rosier and Isleborough, or Long Island. Above this, on the east, stands Fort Castine.

Lights.—Besides the lights already described, the following are exhibited in Penobscot Bay :—

A fixed light, visible 12 miles, on *Mark Island*, on the west side of Deer Island. The building is coloured white, and 12 feet high.

A fixed light at 106 feet above the sea on *Eagle Island*, in Isle-au-Haut Bay, which can be seen about 16 miles. The building is coloured white and 30 feet high.

A fixed light visible 9 miles, on *Pumpkin Island*, as a guide to Buck Harbour.

A fixed light on *Dice's Head*, near Castine, at 130 feet above the sea, visible about 17 miles.

A fixed light on *Old Fort Point*, above Castine, at 103 feet above the sea, visible 16 miles. This is intended to mark the entrance to Penobscot River.

A fixed light on *Grindel Point*, at the entrance of Gilkey Harbour, Long Island, at 39 feet above the sea, visible about 11 miles. This light is attached to the keeper's dwelling, which is coloured red.

A fixed light on *Negro Island*, at the south side of the entrance to Camden Harbour. This light is 52 feet above the sea, and can be seen 12 miles off.

A fixed light on *Whitehead Island*, just outside the bay, on the west side of the entrance. The building is 34 feet high, of grey colour, and shows the light at 70 feet above the sea, visible 15 miles. Attached to this lighthouse is a bell, weighing 1500 lbs., which strikes in foggy weather three times a minute. The light is small but of great importance, as all vessels bound to Penobscot Bay, going in-shore, are obliged to pass by the light through the Muscle Ledges. A stranger wishing to pass this light must, if coming from the westward, run in for the land east of Manheigin, until the light bears S.W.; then steer N.E., and you can pass within half a cable's length of the head.

DIRECTIONS.—Penobscot Bay is we believe being surveyed, but as no charts of it have been published, and as there may be many dangers scattered about, of which we have no knowledge, we cannot do better than recommend strangers always to take a pilot when bound into it. In the event of not being able to get one, the following remarks may be of service.

By proceeding from Mount Desert Rock on a W.N.W. course, you leave the Isle-au-Haut and Fox Islands on the starboard, the Seal Rock, Matinicus Isles, and Green Island, on the port side, and thus arrive off the Muscle Ledge Islands, which lie to the north-eastward of Whitehead Lighthouse, on the western side of the bay.

The fairway course to Owl's Head is N.W. by N. Having advanced to this point, you may bear away for either side of Isleborough or Long Island; proceeding past Belfast Bay and Brigadier Island, keeping the port shore on board. When you pass Brigadier Island for Old Fort Point, (Fort Pownall,) observe, before you come to it, that an extensive ledge of rocks lies about three-quarters of a mile to the E.S.E. of it, which is uncovered at half-tide. These rocks are readily perceived, when the wind blows, by the breakers. You may pass within a cable's length of Fort Point in smooth water.

If bound up the River, from Old Fort Point, with the wind ahead, and an ebb tide,

you may make a good harbour in the East River, at about a league E.N.E. from that point. The entrance of this river is on the south side of Orphan Island; here you may lie safe from all winds, and anchor in 8 or 7 fathoms, good holding-ground. You leave Orphan Island and several rocks, which are above water, on the port hand. If requisite, you may anchor to the N.W. of the island, on the starboard hand, before you pass through; but, with the wind and tide favourable, you may proceed up to Marsh Bay, keeping towards the port shore. Marsh Bay is about 1½ leagues above Orphan Island. When passing the bay, keep nearly in the middle of the river, and you will have neither rocks nor shoals until you arrive at the falls.

To sail up to Castine, &c., by the S.E. and eastern side of Isleborough or Long Island, bring the light on Dice's Head to bear N.E. by N. and run for it, until you are within half a mile of it; then steer E. by N. for the beacon on Hormar's Ledge, leaving Otter Rock beacon on your port hand a cable length's distant, and Bull's Head, Noddle's Point, and the beacon on Hormar's Ledge on the starboard hand. You may approach the starboard shore off the entrance of Castine Harbour to about a cable's length, and steer E.N.E., which will carry you up the Ship Channel. You may anchor off the town, near the wharves, in from 8 to 10 fathoms water. The harbour is easy of access, and the tide rises, F. and C., 10 or 11 feet: it is high water at 10h. 45m.

To enter Penobscot Bay from the S.W.—In coming in from the south-westward, and being near Whitehead, with its fixed light, be careful not to haul in for it until it bears N.E., as you will thus avoid the ledges of rocks, lying nearly W.N.W., one mile, from Whitehead. Within these ledges, at about a pistol-shot from shore, there is a safe passage. In passing the head, to the eastward, you will see a good harbour on the port hand, named Seal Harbour, wherein you may lie safely, with any wind. In going in, give the port shore a berth, to avoid a sunken ledge extending about two-thirds over the mouth of the harbour, which breaks with any sea, except at high water.

Vessels of 60 or 70 tons may double close around the head of the light, and anchor right abreast of the store in the harbour. Those taken with calm and ebb-tide may anchor anywhere off the light in from 12 to 20 fathoms. If the wind takes you at N.E. and ebb-tide, so that you cannot get into Seal Harbour, you may run into Tennant Harbour, which bears W. by S. from Whitehead, about 4 miles distant. To gain this place, continue a W. by S. course until the first house on the starboard hand bears N.N.W., when you may anchor in 4 or 5 fathoms, good ground. In sailing from Tennant Harbour, you may steer E. by N., one league, towards White Island Lighthouse: but be careful not to haul in for it until it bears N.E., as a large ledge of rocks bears about W.N.W. from the head to the distance of a mile.

CAMDEN HARBOUR.—The North-east Ledges bear from the light on Negro Island, at the mouth of Camden Harbour, N.E. ¼ N., distant about three-eighths of a mile. North-east Ledges to Morse's Point, N. by W., distant about half a mile: these ledges are covered at high water, but are above the surface of the water at two hours' ebb. Barit's Point forms the western side of Camden Harbour, and bears from the light S.W. by S. ½ S., distant about three-eighths of a mile. Morse's Point lies opposite the lighthouse, and forms the eastern side of the harbour. Barit's Point to the Graves, S.E. ½ S., distant about 1¼ mile. From the light to the Graves, S. by E. ½ E., distant about 2 miles. Owl's Head Light bears from Camden Light, S. ½ W., distant about 12 miles. From the Graves to the Owl's Head Light, S. by W., ½ W., distant about 10 miles.

In coming from the westward, and bound to Camden Harbour, bring Owl's Head Light to bear South, and steer N. ½ E., for Camden Light, leaving the Graves and North-east Rocks on the starboard hand: the Graves is a small black rock, and is above the surface of the water at all times, and you may approach it within a cable's length on all sides. When up with the lighthouse, leave it on the port hand one cable's length, and steer N.W. by N. ½ N., or N.N.W., distant nearly half a mile, and anchor near the north shore, in from 4 to 5 fathoms water, good holding-ground. If you are to the eastward, and bound for Camden Harbour, bring the light to bear W.S.W., or S.W. by W., to clear the North-east Ledges.

BROAD BAY.—Immediately to the westward of Penobscot Bay is Broad Bay, the navigation of which is too intricate for any description to be of service. At the entrance are many islands and sunken ledges, so that none but those well acquainted ought to attempt to run in. On the north end of *Franklin Island*, one of the islands at the en-

trance of the bay, is a lighthouse 35 feet high, which exhibits a fixed light flashing every 1′ 30″ at 54 feet above the sea, visible 12 miles; from this light the entrance of George's River bears E.N.E., distant 3 miles.

The western point of Broad Bay is named Penmaquid Point. On it there is a lighthouse showing a fixed light at 75 feet above the sea, visible 14 miles, which is very useful to those frequenting Bristol and Waldoborough Rivers. From this light Manheigin Light bears S.E. ½ E., distant 12 miles.

There is also a lighthouse on *Marshall's Point* eastward of Franklin Island; it is 24 feet high, and shows a fixed light at 31 feet above the sea, visible 10 miles. And a light revolving every minute is also shown on the north-east side of the south island at *Tennant Harbour;* the building is coloured white, 26 feet high, and the light can be seen about 13 miles off.

George River.—This river is situated in the eastern part of Broad Bay, and requires the assistance of a pilot to enter. In sailing into it bring the North Damiscove, or White Island, to bear W.S.W., then steer E.N.E. for Franklin Island Light, which stands at the entrance; leave that on the starboard side, and you may sail past within a cable's length of it. When abreast of Franklin Island Light, (which is on your starboard hand,) steer N.E. for Otter Island, distant 4 miles, and when within a quarter of a mile of it, leave it on your port hand, and steer E.N.E. for Cauldwell Island, having a high round rock, named Goose Island Rock, at its S.W. end. When you are abreast of this rock pass it at a distance of a cable's length, leaving it on your starboard side, and steer N.E. by E. and N.E.; but you should keep Cauldwell Island best on board, on account of a sunken ledge lying in the middle of the river.

In beating into George River, you ought to be particularly careful of a sunken ledge, which bears E.N.E. from Franklin Island Light, distant 2 leagues: also of another ledge lying off the S.E. end of Gay's Island, which extends one-third of the way across towards the Goose Rock.

Should you fall in with Manheigin Island in steering for George River, you should steer N.N.W., leaving Manheigin Island to the starboard, until Franklin Island Light bears N.E. by E., when you may run for it, and sail as above directed. Franklin Island Light may safely be run for, when bearing from N.E. by N. to E.N.E.

In running from White Islands for George River, be careful to avoid New Harbour Ledges, which lie E.N.E., distant 3 miles, from Penmaquid Light, and have only 5 feet water over them; and when beyond these, you will see the Western Egg Rock, which bears E.N.E. from Penmaquid Point, W.S.W., distant 2 leagues, and W. by S. from Franklin Island Light, distant 1 league, which leave on your port hand; you will then discover the Eastern Egg Rock, lying nearly South from Franklin Island Light, distant 3 miles, which must be left to the starboard. The Egg Rocks bear from each other E.S.E. and W.N.W., distant 1 league; their appearance is very similar, but you will pass between both, and have an excellent clear and open channel. You may distinguish one from the other by their bearings from the light. Should the wind be ahead, and you be compelled to turn to windward, stand on to the northward until Franklin Island Light comes E.N.E., and to the south-eastward until it bears N.N.E., without any danger. To the northward of the range of M'Cobb's Island, and the Western Egg Rock, the ground is foul and rocky; and so it is to the eastward of the range of Franklin Island Light and the Eastern Egg Rock. M'Cobb's Island forms the western entrance to George River, and bears N.W. distant 1¼ miles from Franklin Island Light.

JOHN'S BAY HARBOUR.—The western side of the entrance of John's Bay Harbour is formed by Thrum Cap Island, which is a small bare island bearing from Penmaquid Point W.S.W., distant about 2½ miles. Penmaquid Point forms the eastern side of the bay, and is a low bare point; but the shores are bold on all sides. The lighthouse is situated on the south-east side of Penmaquid Point, and bears from the western point of the bay E.N.E., about half a mile.

Vessels westerly bound, and falling in with Manheigin Island, and wishing to make a harbour in a strong S.W. wind, must observe the following directions:—Bring Manheigin Light to bear S.E., and steer N.W., distant about 11 miles, for Penmaquid Point; and when the light on the said point bears E.N.E., distant half a mile, you are then up with the western point of Penmaquid: leave it on your starboard hand, and give it a berth of one-eighth of a mile, then steer North for John's Bay Harbour, leaving John's Island,* M'Cown's Point, on your starboard hand, and Butford's

* John's Island is small but high, covered with spruce-trees, and situated near the centre of the bay.

Island, Stuart's Island, and M'Farling's Point on the port hand. If you are from the westward, and bound into this harbour, you bring John's Island to bear N. by E., and run until you are within one cable's length of it: then steer North for High Island Head, which you leave on your port hand, and when abreast of said head, steer N. ¼ E., about three-eighths of a mile, and anchor in from 4 to 5 fathoms water, good holding-ground. John's Bay Harbour lies about 5 miles to the eastward of Townsend Harbour, and is a fair open bay, having no rocks or shoals at its entrance, and vessels may run in without fear, by following the preceding directions.

BOOTH BAY, or TOWNSEND HARBOUR, is the inlet next eastward of Sheepscot River, and may be known by the lighthouse on Burnt Island, with its fixed light. Its entrance lies between Cuckold Islet on one side, and the Bantam Ledges with Damiscove Isle on the other, the distance between which is 2½ miles. With Burnt Island N. by E. you may run in without danger; and thence, with assistance, proceed to the harbour of Townsend.

In coming from the westward, leave Seguin Island on your port hand, giving it a berth of about half a mile; then steer N.E. by E., three leagues, when you will, if clear weather, open Townsend Light, on Burnt Island, bearing about N.N.E.: but still continue your N.E. by E. course until Burnt Island bears N. by E., then stand for it, continuing N. by E., and leaving it on the starboard (?) hand till up the harbour. At about three quarters of a mile, N.N.E., from the light there is a small bold island, named Mouse Island, which you leave on your starboard hand: after passing it you haul up N.E. for the Eastern Harbour, or continue your course N. by E. till you get the Western Harbour to bear W.N.W., when you may run in until Burnt Island is shut in by the land; or, you may anchor anywhere within Mouse Island, as neither rocks nor shoals lie off from the land.

In coming for Townsend, from the eastward, bring Manheigin Light to bear E.S.E., and steer W.N.W. about 13 miles; which course and distance will lead you into the passage between, and to the northward of, the outer island and the main. In steering thus you will make Burnt Island light bearing about N.W. by W.; and then steer W. by N. until you get that light to bear N.W. Then haul up for it, keeping it on your port bow until up with it. You now steer N. by E., and follow the directions given above.

SHEEPSCOT RIVER.—If bound to Sheepscot River, from the westward, and you make the Island of Seguin, (upon which a lighthouse is erected, having a brilliant fixed light at 180 feet above the level of the sea, visible 20 miles,) you will leave the light on the starboard side, giving it a berth of half a mile; and when you pass it to the eastward, you must bring it to bear S.W. by S. and steer N.E. and N.E. by N., 3 leagues, which will bring you to Ebenicook Harbour, on the eastern side of the river, which is fronted by several islets. The entrance of this place is narrow, but it makes like a basin when you get into it. The entrance in lies E. by N. You cannot get in here with a N.E. or easterly wind, but must have the wind South or westerly. After you get into the harbour, you must haul up N.E. or N.E. by N., as there are several sunken rocks on the starboard hand as you go in. There is anchorage in 4 fathoms, muddy bottom, safe from all winds.

But, if bound up Sheepscot River, in a large vessel coming from the westward, you must go to the southward of Seguin Island, steering about N.E. or N.E. by E., one league; and when the river bears North, or North a little westerly, you may run North, and keep the starboard hand best on board. There are many rocks and ledges, some above and some under water, lying to the north-eastward of Seguin; when you get up as high as Ebenicook, leave the two Mark Islands on your port hand, keeping your course North, a little easterly. Here it is requisite to have a pilot.

A brilliant light revolving every 30″ at 40 feet above the sea, and visible 12 miles, is shown from Hendrick's Head, at the mouth of Sheepscot River, on the starboard hand going in.

KENNEBEC RIVER.—Pond Island Lighthouse (situated on Pond Island to the northward of the Seguin Light, and which bears a fixed light at 54 feet above the level of the sea), bears N. ¼ W., 2¼ miles, from Seguin Lighthouse. These lights are intended to facilitate the entrance to Kennebec River, which is one of the most considerable in the state of Maine, but its channel is too intricate to be navigated without the assistance of a pilot.

The following instructions have been given for entering this river:—"If coming into Kennebec River from the westward, keep about a quarter of a mile from

Seguin Light; in doing which you will avoid Jack-knife Ledge, which bears from Seguin Light N.W., distant 1¼ miles, and Ellingwood's Rock, lying North, one-quarter of a mile, from Seguin. After passing Ellingwood's Rock, bring Seguin Light to bear South, and steer North for Pond Island Light. Leaving Pond Island a cable's length on the port hand, care should be taken on the flood tide to haul quickly round Pond Island Point, to avoid the Sugar Loaves, (two small islands bearing North, half a mile, from Pond Island,) upon which the tide sets very strongly. The course after passing Pond Island is about N.W. to the fort on Hunnewell's Point, (to which you will give a berth of a cable's length,) and steer North, one mile, for Coxe's Head, on which also is a fort. The course is then N.E. to Perkin's Island, which you will leave on the starboard hand, about a mile, and you will give it a berth of a cable's length, to avoid two sunken ledges lying nearly abreast of Perkin's Island, and near the middle of the river; then steering about North, one mile, you will have fine anchorage at Perkin's Flats, in 4, 5, and 6 fathoms. This is as far as a vessel, conducted by a stranger to the place, should ever venture to advance, especially with a heavy ship.

There is good anchorage anywhere between Seguin and Pond Islands, when the weather is moderate, in from 5 to 8 fathoms, within half a mile of Pond Island: but should the wind blow with any violence, and you are far enough to windward to weather Ellingwood's Rock and Seguin Ledges, then it will sometimes be advisable to run for Townsend Harbour: or, with the wind at N.W. and a flood-tide, you may, by fetching within a cable's length of the Lower Sugar Loaf, and leaving it on the port side, run into good and safe anchorage, in from 6 to 3 fathoms, in Heald's Eddy.

If bound into Kennebec, and falling to the eastward of Seguin, bring the light on Pond Island to bear N.W. by W., and run for it until within a cable's length, then follow the preceding directions. There is safe anchorage, with an off-shore wind, anywhere between Small Point and Seguin, only taking care to avoid Jack-knife Ledge.

Safe anchorage may be found from Coxe's Head to Perkin's Island, nearest the eastern shore. The usual rapidity of the tide between Seguin and the entrance to the Kennebec is 3 to 4 knots. There is also a passage into the Kennebec River, leaving Pond Island on the starboard hand; but that is not recommended, for only 16 feet can be obtained at high water."

Eastward of Seguin there is deep water. At the westward, the tide of flood sets strongly into New Meadows, and W.N.W. into Broad Sound, and up to Portland; the ebb-tide is the reverse.

Between Seguin and Cape Elizabeth the soundings are various; at times there are 18 or 20 fathoms, rocky bottom, and within a cable's length you will find 30 or 35 fathoms, muddy bottom. The whole of this district is now being surveyed.

There are several rocky ledges near Seguin, which bear from the light as follows:— Five-Fathom Ledge, S. by W., three-quarters of a mile; Ellingwood's Rock, North, a quarter of a mile; Seguin Ledges, N.N.E., distant half a mile, which always dry; Jack-knife Ledge, N.W., 1¼ miles, over which are 8 feet water, Wood Island Reef, N.N.W., distant 1⅛ miles, which has 4 feet water on it: and the Whale's Rock, N.N.E., distant 1¾ miles.

NEW MEADOWS RIVER.—At about 6 leagues, E.N.E., from Cape Elizabeth, and 2 miles westward of Small Point, is the mouth of the Meadows River, a large inlet affording good shelter during adverse winds. If you should happen to fall in with this inlet with the wind at S.E. or S.S.E., and bound to the eastward, you will find good shelter in the above river. In standing to the northward, you will have a large round island on your starboard hand covered with spruce-trees, together with two large rocks, one named the Brown Cow and the other the White Bull, which are some distance from each other.

When sailing in, you must leave the Brown Cow on your starboard, and the White Bull on your port hand, and may approach to the latter within a cable's length, and when you have passed it, should steer for Horse Island, lying to the starboard, which has a house upon it, and to which you may approach within a quarter of a mile. To the westward of the island there is a large rock, which is covered at high water, but is bare at half-tide; you may go on either side of it when it is in sight, but the widest passage is to the eastward. When you have passed this rock, steer N. by W. or N.N.W., which course will carry you up to a large island, named Bear Island, which is covered with spruce and birch-trees. When you have passed this island about a quarter of a

mile, you may haul in for the starboard shore, and anchor in 5 or 6 fathoms water. This is the best place for anchoring with the wind S.S.E. or East; but it is necessary to be careful of a ledge of rocks running to the northward of this island, about half a mile off.

You may anchor in this bay according to the direction of the wind; if it should be to the eastward, anchor on the east side. If you have lost your anchors and cables, there is a large cove on your starboard hand, about 2 miles from Bear Island, bearing about North, which is sufficient to hold 30 or 40 vessels; it is land-locked all round, so that no wind can damage a vessel after she gets into it.

HUSSEY SOUND.—If from the eastward, and you make Seguin Light, bring it to bear East, and steer West for the Sound, if you have daylight and a leading-wind, as you have nothing but islands on your starboard hand, between which the tide of flood sets strongly; when you get within 2 miles of the Sound, you will make two islands, without trees, named Green Islands. Continue your course till Hussey's Sound bears N.N.E., then steer in. When past the two islands, after entering the Sound, leave three islands on your port, and two islands on your starboard side; the northern island on your starboard is called Smith's Island; when you have passed it about three-quarters of a mile, you may haul away E.N.E. till you shut in the said island to the S.E., then anchor, in 8 or 9 fathoms, muddy bottom, with Hog's Island to the S.W., Basket Island to the N.W., Great Gabegue Island to the N.E., and Smith's Island to the S.E. In this harbour 200 sail of vessels may ride safely from all winds: and when wind and tide serve, may be out to sea again in an hour.

The *Half-way Rock* is high and black, about 600 feet in diameter, and elevated about 16 feet above the level of the sea. At the distance of 600 feet from the rock, on the N.W., North, N.E., East, and S.E. sides, there are 5 and 6 fathoms, deepening gradually to 25 fathoms, within three-quarters of a mile. From it a reef extends W. by S., one-eighth of a mile, and has 10 fathoms within a cable's length of it. You may approach this rock on all sides within a quarter of a mile, and find from 15 to 25 fathoms.

The *Drunken Ledges* may be seen at all times breaking with a little motion of the sea. Mark Island is small and bare, with a stone monument on it as a guide for vessels running into Broad Sound. Eagle Island is small, high, and covered with trees; it is situate at the entrance of the said sound. Mark and Eagle Islands form the eastern side of the entrance to Broad Sound; and Brown Cow and Jewill's Islands the western side. Green Islands are two in number, and bear from Jewill's Head S.W., distant $1\frac{1}{2}$ miles.

The *Bulwark*, a not very extensive ledge, being barely half a mile in circumference, has $2\frac{1}{2}$ fathoms on it at low water, gradually deepening to 5, 7, 8, and 12 fathoms. It bears from Portland Lighthouse, E.S.E., about 6 miles; and from Cape Elizabeth, E. by N. nearly 6 miles. It is marked by a buoy, and the sea breaks over it during strong S.E. winds.

PORTLAND.—Portland Harbour is situated at the outfall of the River Stroudwater, and has an extent of about $1\frac{1}{2}$ miles, with a depth at low water of $1\frac{1}{2}$ to 5 fathoms, the latter being immediately off the wharves of the city. The approach to it is through the channel formed by the islands Bang, House, Ram, Peak, Great and Little Hog (which are all more or less connected together by a shallow flat) and the main land, which channel is nearly half a mile wide, lies in a N. by W. and S. by E. direction, and has a depth decreasing from 10 to 7 fathoms. The harbour is consequently landlocked, and affords ample and secure protection to vessels from all winds. It is high water on the days of full and change of the moon at 11h. 25m.:—mean rise of springs $9\frac{3}{4}$ feet and neaps $7\frac{1}{2}$ feet.

The lighthouse on Portland Head on the south side of the channel to the harbour is 49 feet high, and shows a fixed light at 81 feet above the sea, visible 14 miles; near it is a fog bell which is struck by machinery every 30″ during thick weather. There is also a small *red* light on the extremity of the breakwater at the south side of the harbour.*

* On Fort Hill, Portland, there is an observatory, from which vessels approaching the coast can be seen even at a distance of about 40 miles. Shipmasters requiring assistance should place their ensign over the private signals, and if they are sufficiently near to be clearly seen, information of their situation will be conveyed to the owners. We believe that if this building is brought in one with Portland Lighthouse, it will clear Alden Ledge.

Immediately in front of the approach to Portland Harbour there is a small rock 26 feet under the surface of the water, named Jordan. It has soundings close round it of 4 to 8 fathoms, and is marked by a buoy. The bearings from it are Portland Lighthouse, N.W. by W. $\frac{1}{8}$ W. one mile; Ram Island N. by E. $1\frac{1}{8}$ mile; and the lighthouses on Cape Elizabeth S.S.W. $3\frac{1}{4}$ miles.

The coast southward of Portland to Cape Elizabeth, a distance of $3\frac{1}{2}$ miles, is rocky, and has a depth of about 6 fathoms almost immediately off it. At $2\frac{1}{4}$ miles southward from Portland Lighthouse there is a slight projection of the land, from which a reef named Trundy's Ledge extends out nearly a mile in a N.E. by E. direction, and is marked at its extremity by a black buoy; the reef near the land is awash at low water, but in other parts the soundings over it are 3 to 2 fathoms at the same period of tide. As the lead drops from the reef at once into 5 and 6 fathoms water, great circumspection is necessary when navigating in its vicinity.

Besides Trundy's Reef there is a small rocky patch of 6 feet water nearly midway between it and Cape Elizabeth, which is also marked by a black buoy.

When steering for Portland from the southward do not approach Cape Elizabeth nearer than 4 miles on account of the various rocks that lie off it; bring Portland Light to bear N.W. by N. and steer with that mark on until you are $\frac{1}{8}$ of a mile from the lighthouse, when you should change the course to N. by W. towards the southwest end of House Island. When Fort Preble bears S.W. by W. $\frac{3}{4}$ W., steer N.W. $\frac{1}{2}$ W. till well past the breakwater, when a W.S.W. $\frac{1}{4}$ W. course will lead into the harbour to the anchorage off the wharves.

If instead of anchoring off the wharves the roadstead of Hog Island be preferred, steer N.E. as soon as Fort Preble bears S.W. by W. $\frac{3}{4}$ W., and it will carry you into it. The depth here is 4 to 7 fathoms, and there is excellent shelter from all winds.

CAPE ELIZABETH is a bold point having two white buildings upon it, each 53 feet high, one of which shows a fixed and the other a revolving light of 1′ interval. As these lights are 143 feet above the sea they can be seen in clear weather at a distance of about 17 miles. The utmost care is requisite when approaching the cape, because some very dangerous reefs lie off it at various distances, all of which are steep and have deep water in their immediate vicinity. These reefs bear the names of Taylor, Old Anthony, Alden,* and Hue and Cry; the latter is the outermost. They are all buoyed we believe, and as an additional means of keeping vessels from them a bell boat has been moored near the Alden Rock.

The depth close to the rocks at the base of the cape is about 6 fathoms, and there is a passage sufficiently deep for the largest vessels between the reefs just mentioned and the land, but this, it is almost needless to say, should only be attempted by those having an intimate knowledge of the locality. The shore near the lighthouses forms two coves named Dyer's and Staple's, which are too open and exposed for anything larger than boats.

CAPE ELIZABETH TO CAPE ANN.

RICHMOND ISLAND.—Immediately westward of Cape Elizabeth is an island of about a mile in extent, named Richmond, which is connected to the shore by a ledge

* Lieutenant Woodhull, U.S. Navy, who surveyed Alden's Reef in 1854, reports as follows:—"It lies about N.E. and S.W., and by compass the north light on Cape Elizabeth bears from it N.W. by W. 3 miles; barn on Richmond Island West $4\frac{1}{2}$ miles; Portland Light N.N.W. $\frac{1}{4}$ W. $6\frac{1}{4}$ miles; and the light on Wood Island S.W. by W. $\frac{1}{4}$ W. about 14 miles. It is about 950 feet long and 250 feet wide. Its shoalest part is on the west side, and through its centre from north to south the water is quite deep; which circumstance doubtless gave rise to the belief that there were *two* distinct rocks or ledges, which supposition, I think, is entirely disproved by my recent survey. The rock, as it is called, but which more properly should be considered a reef, is of immense dimensions, extremely irregular in form, having shoal projections on it from $4\frac{1}{2}$ to 24 feet, at low water. I discovered but one rubble with $4\frac{1}{2}$ feet water on it, one with 6, several with 8, and a very considerable number of shoal spots with 11, 12, 13, 14, 15, &c. feet, all estimated at low water.

The reef lies immediately in the way of all navigation, and particularly of vessels bound westward, or of those leaving the harbour at Richmond Island. I consider this the 'great danger' when approaching Portland Harbour, and the 'key' to the lesser ones of the *Hue and Cry*, *Old Anthony*, and *Taylor's* Reefs. It is the cause of much anxiety and care to the navigator, and one that is avoided with the greatest difficulty in thick weather, and during the prevalence of the terrible easterly storms by which the coast of Maine is so frequently visited."

partly dry at low water.* From the eastern end of this island some dangerous rocks, named Watts' Ledge, extend out ⅛ of a mile, close to which is a depth of 3 and 5 fathoms, rendering it imprudent to approach this side of the island very closely; a sunken ledge, called West Ledge, also runs out from the west end of the island about ⅛ of a mile, and it is necessary when rounding this end of the island to do so at a moderate distance, in order to give the ledge a good berth. On the north-west side of the island, in the harbour, there is a small wharf.

In the bay eastward of Richmond Island, between it and Cape Elizabeth, there is a depth of 5 to 2½ fathoms on a bottom of hard sand and rock: but so many dangers are scattered about, that no prudent shipmaster would attempt to anchor here. These dangers are mostly under water, and bear respectively the names of Stephen's Rock, the Sisters, Seals, Dancing Breaker, and Crowell's Rock.

The harbour on the west side of the island is safe to ride in with winds from any point between North and S.W., and is convenient when vessels are unable to get to Portland, as it is easily entered. The depth is from 8 to 2½ fathoms, and the anchorage being of clay, with a crust of coarse sand from 6 inches to a foot in thickness, is very good for holding. On the north side of the harbour there is a small island, named Ram, having near it some rocks called the Brothers, and also a rock named the Chimney; the latter is visible at half tide. At nearly 2 miles W. ⅜ N. from the west end of the island is a rock also dry at half tide, named Old Proprietor; and at the back of the harbour is the outlet of the small river Spurwink.

To enter the harbour, stand in by the western extremity of the island about N. ½ W., being careful to give it a good berth on account of the West Ledge, a rock under water lying about ⅛ of a mile from the point: this rock is very dangerous, as it has a depth of 5 and 6½ fathoms close to it. When the western light on Cape Elizabeth is well open, then haul up until the wharf bears East, when you may anchor in the best anchorage for vessels of heavy draught. Vessels of lighter draught may stand in until the wharf bears S. by E. When beating in, the only precaution necessary is to look out for the Old Proprietor and the Chimney Rocks, for if you struck on them the vessel might suffer serious damage.

When approaching the harbour from the eastward, give the island a berth of ¼ to ½ a mile, until its western extremity bears N.E. by N., then haul up N. ½ W., and proceed as before.

It is high water here on the days of full and change at 11h. 30m. The mean rise at spring tides is 11 feet, and at neap tides 7½ feet. The set of the tidal current does not exceed ⅜ of a mile per hour, and its direction in the harbour as well as outside is much influenced by the wind.

WOOD ISLAND.—From Cape Elizabeth to Wood Island, on the south side of Saco Bay, the course and distance are about S.W. ½ S. 8 miles; and thence to Cape Porpoise S.W. 9 miles.

Wood Island is high and woody, and has on its eastern side, near the entrance of the Saco River, a lighthouse 47 feet high, which exhibits a red light revolving every minute at 62 feet above the sea, visible about 13 miles.

The harbours formed by Wood Island should only be attempted with the assistance of a pilot, as access to them is somewhat difficult. In the event of not being able to obtain one, perhaps the following remarks may be found useful. When sailing from the south-westward bring Wood Island Light to bear N.N.W. or N.W., and run until within a cable's length of it. You may go into the harbour either eastward or westward of the island. There are several rocks westward of the island, and also a long bar which lies to the S.W., about ¾ of a mile distant, together with two ledges, one of which bears S.E. by S. from the light, distant ½ a mile, having 10 feet water on it at low tide, and the other is a dangerous ledge named Danceberry, bearing S. by E. from the light, distant about ¾ of a mile, and breaks at all times. When you have the wind to the southward, you may lay your course in, and anchor near Stage Island, on which is a monument: this is named Winter Harbour. You may go in the eastern way, and have room to turn your vessel, which is an advantage you cannot have in going to the westward; but here you are exposed to the wind at N.E. and E.N.E.; but

* It has been proposed to erect a breakwater upon this rocky ledge, in order more effectually to shelter the bay on the west side of the island, and so form a *harbour of refuge*, which is much needed on this part of the coast.

if your cable and anchors are not good, you may run into the Pool, and lie safe from all winds (1820).

Saco lies about a league north-westward of Wood Island. It is a barred place, and has a depth of not more than 10 feet water at high tide, but notwithstanding this disadvantage a considerable trade is carried on.

CAPE PORPOISE is about 8 miles southward of Wood Island. On Goat Island, at the entrance to the harbour of the Cape, there is a lighthouse 25 feet high, which shows a small fixed light at 38 feet above the level of the sea, visible about 10 miles.

Cape Porpoise Harbour affords shelter to small coasting vessels, and is principally used by them, as at low water vessels drawing 10 feet lie aground. Strangers ought to take a pilot, the harbour not having been surveyed, and it would be imprudent to attempt to run in without. In the event of not obtaining one, the following remarks may be useful:—

If you are from the eastward, and make Wood Island Light, when bound to Cape Porpoise Harbour, bring that light to bear N.E. by N., and run S.W. until Cape Porpoise Light bears N. by W.; then steer directly for this light until you shut in Wood Island by the eastern head of Cape Porpoise Harbour, when you will be abreast of a ledge, upon which the sea breaks when the wind is at all high, named the Old Prince, lying $\frac{1}{3}$ a mile, S.E. by S., from Cape Porpoise Light. Now steer N.N.W. until Cape Porpoise Light bears E.N.E., when you will be up with the entrance of the harbour. If it should be low water, you must keep midway between the two points, but with high water keep the port shore best aboard. From between the two points steer N.W. $\frac{1}{4}$ of a mile, and then anchor in 3 fathoms, at low water. By following these directions you will find from 3 to 6 fathoms water. The harbour is not safe except with a fair wind. Opposite to the lighthouse is Folly Island, which forms the western side of the harbour. The S.S.E. point of Folly Island bears from the light S. $\frac{1}{2}$ W., about $1\frac{1}{4}$ mile, and a shoal projects from it to nearly a mile.

A spar buoy, painted red, and elevated 9 feet above the water, is or was moored in 8 fathoms, at low water, near the Old Prince, with Cape Porpoise Lighthouse, bearing N.N.W., distant about $\frac{5}{8}$ of a mile; the Old Prince being distant from the buoy about $\frac{1}{3}$ of a mile on a N.N.E. bearing. When running for Cape Porpoise Harbour you may go on either side of the buoy, by keeping it close on board, and after passing it, bring it to bear S.E. by S., and steer N.W. by N. for the entrance of the harbour. The above directions given for entering can then be followed (1835).

KENNEBUNK lies south-westward from Cape Porpoise, and vessels bound to it must have the assistance of a pilot. At the mouth of the harbour are two piers (one on the northern and the other on the southern side of the channel) running from the shore about 3 to 400 feet towards the bar, and extending a little beyond low-water mark, with a flagstaff and beacon on the top, which may be seen about one mile distant. Due south from the head of the piers, at the distance of $\frac{3}{4}$ of a mile, is a rocky ledge named the Fishing Rocks, which is covered at high water: between this and the head of the piers is the anchoring ground. You should keep well to the eastward of this ledge when approaching, although a tolerable passage lies westward of them, but it should only be navigated by those acquainted. On the bar are only 2 or 3 feet at low water; but there is a rise and fall of common tides of from 8 to 9 feet, increasing sometimes to 10 and 12 on full and change.

The Fishing Rocks extend E.N.E. and W.N.W., and are partly dry at 2 hours' ebb, so that the sea breaks upon them with the least swell, or when there is a little wind. Near the rocks is, or was, a red spar buoy, in 4 fathoms at low water, and elevated 10 feet above the surface of the sea, and on the shoal a spindle is also erected, with a cask at the top; this latter bears from the spar buoy S.W. by W. $\frac{1}{2}$ W., distant $\frac{1}{4}$ of a mile. The spindle lies with Flying Point bearing E. by N., $\frac{3}{4}$ of a mile; Fox Point N.E., $\frac{3}{4}$ of a mile; Boothby Point N. by W., about $\frac{3}{4}$ of a mile; and Harding's Rock W.N.W., about $\frac{3}{8}$ of a mile. Kennebunk is frequented principally by vessels in cases of distress.

The course and distance from Cape Porpoise to Cape Neddick are nearly S.W., $12\frac{1}{2}$ miles: between lies Wells Bay, and immediately northward of Cape Neddick is the Cape Harbour, which is very small.*

* The White Hills are an important landmark for this part of the coast, as they may be seen many leagues off at sea, like a bright cloud above the horizon, and when no other land is in sight. Their position is about N.W. from Portland, and N.N.W. from Wood Island. They have been seen

BOON ISLAND, &c.—When making the land between Cape Porpoise and Portsmouth, more than ordinary care is requisite, because some islets and shoals lie off it at various distances, and particularly in the vicinity of Portsmouth. Upon account of these, strangers are recommended not to go northward of lat. 43° when the weather is thick, neglect of this simple precaution having proved fatal to many shipmasters. The northernmost of these islets is Boon Island, which is low and of but small extent, being only about ¼ of a mile long; it is situate in lat. 43° 7′ 15″, and long. 70° 28′ 15″, and is consequently 5¾ miles S.E. ½ E. from Cape Neddick. For the purpose of aiding shipmasters to avoid the various dangers in its neighbourhood, a lighthouse 123 feet high has been erected on its western part, which shows a fixed light at 133 feet above the sea, visible 17 miles. This light is 46 miles from Seguin Light, and 30 miles from the two lighthouses on Cape Ann.

It has been stated that there is a ledge of rocks at about a mile northward from Boon Island, which renders a close approach to that side of the island dangerous; this may or may not be the case, but there is certainly a sunken rock at about ¾ of a mile from it, in a W.S.W. direction, so that shipmasters will be prudent in giving the island a wide berth on that side. This rock is named Pollock, has but 17 feet water upon it at low tide, and we believe has deep soundings at a short distance from it.

At about 3 miles E. ½ S. from the lighthouse there is a sunken rock, which, its position being so much seaward from the island, is extremely dangerous; it has therefore been marked by a bell-boat. The soundings around this reef are very deep, a cast of 52 fathoms having been obtained at a mile eastward from it, and 26 fathoms at the same distance from it northward. At about midway between it and Boon Island there is a rocky patch of 4½ fathoms.

It has been asserted that in the vicinity of Boon Island a current is frequently found setting to the south-westward, but further observations are required to establish the fact.

York Ledge.—At nearly midway between Boon Island and Portsmouth Harbour there is a rocky shoal named York Ledge, part of which becomes dry at three-quarters tide. Upon it a beacon has been erected, so that if ordinary precaution be exercised a vessel will have but little difficulty in avoiding it. As a sunken ledge of 4 to 6 feet water extends from the beacon about ¾ of a mile in a north-easterly direction, shipmasters must give it a wide berth on that side, approaching it only with great care, and especially as there is a depth of 7½ fathoms close to its extremity. Between this sunken ledge and Pollock Rock near Boon Island, the soundings appear to average 15 to 13 fathoms. There is also a sunken rock immediately off the west side of the beacon.

At 1¾ miles S.W. ½ S. from the beacon on York Ledge, and E. 1° S. 4 miles from the lighthouse on Whale's Back Ledge, Portsmouth, there is a sunken rock of 6 feet water, named Murray's Rock.* The depth close to it is 4¾ fathoms. There is also a rock 12 feet under the surface, at ½ of a mile eastward of this rock.

ISLES OF SHOALS.—Besides Boon Island and York Ledge there is a remarkable cluster of rocky islets lying off the shore between Cape Porpoise and Cape Ann, at about 6 miles south-eastward from Portsmouth Harbour. In the course of the survey of this part of the coast the group has been examined, but the result of this exploration has not yet been made public. The following description we have derived from various sources, but it is necessarily imperfect in some of its details.

The Isles of Shoals may be seen in clear weather from a considerable distance, and the various objects upon them, the lighthouse, meeting-house, &c., aid considerably in recognizing them. If bound to Newbury or Portsmouth give the islets a large berth by going fully 3 miles southward of them, because that at about 2 miles from them there is a dangerous rock, named Innes, which dries at or a little before low water; the position of this rock is said to be about 2 miles S.W. by S. from Star Island.

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in latitude 43° 10′, at 46 miles from Cape Elizabeth, where there are 80 fathoms of water, muddy ground. If, from this spot, a W.N.W. course be steered, the Agamenticus Hills will soon come into view; these, when bearing W. by N., 6 or 7 leagues, appear to be three in number, the smallest being to the eastward; at the same time will be seen Wells, or Bonabeg Hills, bearing W.N.W. From the northern part of Jeffery's Bank, in 45 fathoms, the hills of Agamenticus bear W. by N. to W.N.W.

* Lieutenant Murray, U.S. Navy, who discovered this rock through his vessel striking upon it while surveying in 1858, says that "it may be cleared, after doubling the bell-buoy off Boon Island, by keeping the Whale's Back open northward at least two points, until the monument on York Ledge is passed. The depth within a ship's length of the rock is 7 to 11 fathoms." We believe that it has been buoyed.

White Island, the south-westernmost of the Isles of Shoals. is a rocky island three-quarters of a mile in length from S.E. to N.W. Upon it there is a lighthouse 40 feet high, which shows a light revolving every half minute at 87 feet above the sea, visible 15 miles; its position is lat. 42° 58′ and long. 70° 37′ 4″. From its north-west end a reef extends out about one-third of a mile.

Londoner's Island lies about 1½ mile northward of White Island. It is about five-eighths of a mile in length, and high at each end; but, at high tides, the middle is sometimes covered. The island is surrounded with rocks, some of which are always above water. The south end bears West from the meeting-house, and the north end about W.N.W. ½ W. from the same object.

Star Island, distinguished by its meeting-house, is about ¾ of a mile in length from S.E. to N.W., and about ½ a mile in breadth; its north end is covered with buildings. The meeting-house stands on an eminence, a little northward of the middle of the island, fronting the west; the roof of this building is only 12 feet high, but thence to the top of the steeple, which stands in the middle of it, is 30 feet more: and the whole height, from the surface of the water, is about 65 feet. Being painted white, it may be seen from a distance of 8 or 9 leagues.

Off the south end of this island, at about three-quarters of a mile from shore, lies a rock named Anderson's Rock, which is uncovered at half-tide, and should, therefore, have a good berth when passing. From the meeting-house it bears about S.S.E. There is also a rock between Star Island and Londoner's Island, bearing from the meeting-house N.W. by W. ½ W., distant one-third of a mile.

Cedar Island lies eastward of Star Island; it is small, being only about ¼ of a mile from east to west. The east end bears from the meeting-house E. ¼ N., and the west end E.N.E. ½ E., three-eighths of a mile from the same object. At half a mile from the south-east end of the island is a rock, uncovered at half-tide, which bears E. by S. from the meeting-house.

Smutty Nose Island is nearly a mile in length from east to west, and about half a mile in breadth. It may be known by a windmill on its north part. At its west end there is a fine harbour, named Haley's Cove, where fifteen or twenty small vessels may lie safely in all winds. There are several buildings near this place. Between the island and Hog Island, which lies to the northward, there is a sufficient depth of water for any vessel, by keeping nearly in mid-channel; but there are reefs on each side. The east end of Smutty Nose Island bears from the meeting-house nearly E.N.E. five-eighths of a mile.

Hog Island, a high islet northward of Smutty Nose Island, is about one mile in length from east to west, and five-eighths of a mile from north to south. The west end lies from the meeting-house N. by W. ¼ W., and the east end N.N.E., seven-eighths of a mile from the same building.

Duck Island, the northernmost of the Isles of Shoals, is low and rocky. Some parts are covered at high water, and rocks project from it in every direction, especially at its north-west end, where a ledge runs off to the distance of half a mile. It is the most dangerous of the Isles of Shoals, and must be cautiously avoided. Its east end bears from the meeting-house nearly N. by E. ¾ E.

Cape Neddick on the main land is a cliffy point with a detached bold rock named the Nubble, close to it. Hence to York River the distance is about 2½ miles, and the shore, with the exception of just under the cape, is shallow to nearly half a mile out; this flat, however, decreases in breadth from the coast as you approach the north point of the river. The soundings on a supposed line from the cape to the river average 6 fathoms.*

York River is but a narrow stream, yet its outlet forms a good harbour for small vessels, where shelter may be obtained against winds from the land; it is consequently much resorted to by coasters. The depth is 3¾ to 2 fathoms at low tide. Some rocks named Black and Milbury Ledges lie off the north shore, rendering great care neces-

* In the Report of the Coast Survey, presented to Congress, 1858, it is mentioned that several dangers had been discovered by the surveyors while examining this part of the coast; but as they have not been inserted on the published sketch chart of the coast, and detailed particulars of them have not to our knowledge been made public, we can only allude to them. They comprise a detached rock ⅞ of a mile northward and eastward of York Ledge; Duck Island Ledge; Boon Island Ledge; a fishing ledge off Kennebunk; a rock off York River, at more than a mile from the shore, and bare at low tides; and a rock off Cape Neddick.

sary when running in; two patches of 18 and 16 feet also lie nearly ¼ mile S.S.E. ½ E. from East Point, the north point of the river.

From York River to Portsmouth Harbour the distance is nearly 5 miles, along a rocky coast. When tacking, beware of the Stone Rock, 8 feet under water, situate half a mile off the shore at about 1⅓ mile from the river.

PORTSMOUTH.—Portsmouth is an excellent harbour situate at the outlet of the Piscataqua River, which joins the sea in about lat. 43° 3′, and there forms by its channels a number of small islands of which those named Great and Gerrish are the most to seaward. The channel inwards has a depth of 7 to 8 and 9 fathoms, and there is excellent accommodation and shelter for shipping. The town is three miles from the mouth of the river, following the course of the stream.

East side of Harbour. Gerrish, the easternmost of the islands forming Portsmouth Harbour, has on its eastern, southern, and south-western sides, some detached rocks, awash, or nearly so, with the surface of the water; but none are further out than three-quarters of a mile. These bear the names of East Sister, West Sister or Branscomb, Philip, Kitt, Whale's Back &c., and we believe that buoys mark their most seaward limits, so that if vessels keep outside that distance from the island, and clear of the line of buoys, they will incur no risk of damage from them when approaching the harbour from the north-eastward.* Some small islets are also at a short distance from the south-west end of the island, but are connected to it by a shallow flat. On the west end of one of these ledges, the Whale's Back, and consequently on the east side of the entrance to the harbour, there is a lighthouse, 40 feet high, which shows a light flashing every 1½ minute at 58 feet above the sea, visible 12 miles.

West side of Harbour. Great Island, on the west side of the entrance to the harbour, is about three-quarters of a mile in extent, and has on its north shore a village named Newcastle. Its south side forms, with the main land, a snug little anchoring place for small vessels, named Little Harbour, where is a depth of 3 to 10 feet water. At the north-east end of the island is Fort Constitution, and at ¼ of a mile southward of this there is a ledge of rocks running from the shore called Stielman Rocks, the extremity of which is marked by a buoy.

Light. Besides the light on Whale's Back Ledge, already mentioned, there is a lighthouse (the Portsmouth Lighthouse) at Fort Constitution, which shows a fixed light at 70 feet above the sea, visible 14 miles. The course into the harbour is N. ½ E. between these lights.

Gunboat Shoal. Outside the harbour, and at about a mile from the coast south of Great Island, there is a shoal of 3½ and 4 fathoms named the Gunboat, upon which a cast may perhaps be obtained when making the port from the southward. It is not more than a quarter of a mile in extent, and has soundings of 6 to 10 fathoms close to it. Its position is S. ¼ W. 2⅞ miles from Portsmouth Lighthouse; S. by E. 1¼ mile from Odiorne Point; and S. by W. ¼ W. 2¼ miles from Whale's Back Lighthouse. Upon it the sea breaks in rough weather.

DIRECTIONS.—*When approaching Portsmouth Harbour from the eastward of the Isles of Shoals at night,* bring Portsmouth Light to bear N.W. ¾ W. and continue on this course until White Island Light bears S.W. by S., then steer W.N.W. till Portsmouth Light bears N. ¾ W., when you may stand on thus until the light on Whale's Back Ledge comes abreast of you. If during *day,* give Duck Island, the northernmost of the Isles of Shoals, a berth of one mile, and steer W.N.W. till Portsmouth light bears N. ¾ W.

If making the harbour from the vicinity of Cape Ann, bring White Island Light to bear East 1½ miles, and steer N. ¾ W. for Portsmouth Light, being careful in the latter course to avoid the Gunboat Shoal already mentioned.

If making the harbour from the northward and eastward, and you are between York Ledge and the coast and at about half a mile from Cape Neddick, steer S.W. by S. 8 miles, or till Portsmouth Light bears N.W. ¾ W., then steer West to bring it to

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* The positions of these rocks are as follows:—

Kitt Rocks, under water, and marked by a buoy, are S.S.E. ½ mile from Whale's Back Lighthouse.

Philip Rocks, under water, are E. ¾ S. ⅞ of a mile from Whale's Back Lighthouse; E. ¾ N. ⅞ of a mile from Kitt Rocks; and ⅞ of a mile off Gerrish Island.

West Sister, above water, is ½ of a mile north-eastward from Philip Rocks.

East Sister, above water, is half a mile N.E. from West Sister, and nearly 1½ mile E. by N. from Whale's Back Lighthouse; it is consequently ¼ of a mile from the high-water mark on Gerrish Island.

bear N. ¾ W., when you may proceed as before. If you should be outside or eastward of York Ledge, bring the lighthouse on Boon Island to bear East 1½ mile, and steer S.W. by W.; when Portsmouth Light bears N.W. ¾ W. steer West, until it bears N. ¾ W.*

Running into the Harbour. The course into the harbour is with Portsmouth Light bearing N. ¾ W., until the lighthouse on Whale's Back Ledge bears S.E. by E., when you must steer N. ½ E. until abreast of Fort Constitution. Round this fort, giving it a berth of ⅛ to ¼ of a mile, and then steer N.W. till Portsmouth Light bears S. by E., when you may anchor in 8 or 9 fathoms good ground. If, however, it be desirable to proceed to the city instead of anchoring, steer from the above bearing W. ¼ N. towards Fort Washington, keeping in mid-channel. When the two south ship-houses in the Navy Yard open westward of Seavy's Island, steer N.N.W. ½ W. till the south-west point of Badger's Island is in range with the inner end of the wharf on Noble's Island, then steer for the upper end of the city and anchor abreast the wharves.

When beating into the outer harbour the limits on the *west* side are, Portsmouth Light bearing N. ¾ E.; and, on the *east* side, while south of Wood Island, Portsmouth Light bearing N. by W. ½ W., but while north of Wood Island, Whale's Back Light just open westward of that island.

It is necessary to give the buoys on Kitt Rocks and Stielman Rocks a good berth, the former not less than 200 yards, and the latter 100 yards; and, when passing up the inner harbour, the buoys marking ledges on the port hand a berth of 30 feet.

Hampton. From Portsmouth to Hampton Harbour the distance is about 10 miles. This harbour is but a small place, affording very indifferent accommodation; we possess no description of it, and believe that it is only frequented by the smallest coasters. It is said that several sunken rocks lie off its entrance.

NEWBURYPORT.—The entrance to Newburyport Harbour is 6 miles southward from Hampton Harbour, and 16 miles from Portsmouth, and is formed by the outfall of the Merrimack River. The channel over the bar being of sand and influenced by the prevailing wind, changes so much that instructions for crossing it are useless; the assistance of a pilot is therefore always necessary. During easterly gales it is scarcely possible to enter the river owing to the very heavy sea on the bar, and the uncertainty of the direction the channel may have taken.

Lights. On the south side of the entrance to the river, and on the north end of Plum Island, are two fixed lights, the more powerful of which is visible at a distance of 13 miles. The beacon light is shifted according as the changes of the channel may render necessary.

When approaching Newburyport from the south-eastward, the direct course from a position two miles northward of the Salvages, off Cape Ann, is N.W. about 11 miles. As soon as you decrease the water to 12 or 11 fathoms, anchor, unless a pilot be ready to assist you in crossing the bar. The river should not be approached nearer than that depth, because if a strong easterly wind commence to blow, very great difficulty would be experienced in keeping off shore.†

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* When approaching Portsmouth Harbour from the north-eastward, Murray's Rock, already mentioned as being 1¾ mile south-westward of York Ledge, must be very cautiously avoided. It is, we believe, marked by a buoy. Refer to page 71.

† The Marine Society of Newburyport erected, some years since, at their own expense, several huts, at proper distances from each other and from the shore, and supplied them with fire-works, fuel, straw, &c.; but owing to the strong winds driving the sand from their foundations, and the inhuman conduct of people who visited Plum Island in summer, these huts were in a few years totally destroyed. The misfortunes attending this generous and humane attempt in favour of the ship-wrecked mariner, deterred the Marine Society, as well as other bodies and individuals, from a like benevolent attempt, until the establishment of the Merrimack Humane Society in 1802. Conceiving it absolutely necessary that some relief should be afforded the unfortunate sufferer on so desolate a spot, and in the most inclement season of the year, the Society voted to build three huts on the island, and have carried their generous resolutions into full effect. The exertions of this benevolent Institution will be, in future, to preserve these huts in repair, and in perfect supply of materials for fire, and other necessaries for the support and preservation of life. Many, no doubt, will owe their lives to the humanity of this design, and with grateful feelings contribute themselves to the preservation of others. The expense and trouble will be trivial in comparison with the noble purposes it may answer; and the hope of its answering these purposes will be alone a sufficient remuneration to the generous projectors.

From the report of a Committee, appointed by the Society, which was published a few years since, we have the following description of the huts, and directions to the mariner where to find them:—

"The house for the keeper of the lights, erected by the United States, is about 20 rods south from the lighthouses. About 2500 paces, or 1⅛ miles, south from this house and the lights, on the inside

Some years ago the following signals were in use at Newburyport, and, for aught we know to the contrary, may be so still. They were exhibited when the sea on the bar was too violent for pilots to cross it.

"When a vessel comes into the bay, and cannot get over the bar at high water, owing to insufficiency of the tide, a red square flag will be hoisted up, with a pendant under it; and, so soon as these signals are seen from the vessel in the bay, she must keep off, and try some other port.

When the usual signals for vessels are kept up, the ship must lay off and on, without the bar, keeping to windward until signals be made for her to come in: and when it is a suitable time to come over the bar, a red square flag will be hoisted half-mast; she may then come in, keeping the lights in a range or in a line.

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of the island, is the first hut, to which the mariner, in daylight, may be directed by a beacon, about 300 paces to the east, with a hand pointing to the hut.

2900 paces, or about 1¾ miles, south from this, is the second hut, with a similar beacon, about 400 paces S.E., pointing to it.

1700 paces, or about a mile, south from this, is a third, with a beacon, bearing East, 500 paces distant.

5000 paces, or about 3 miles, south of this, is a house occupied by Mr. Spiller and family, which is about a mile from the south end of the island; and about West, a mile from the south end of the island, are two other houses, with families.

These huts, together with the other houses mentioned, form a chain from one extremity of the island to the other. The unfortunate mariner, whose fate may wreck him on this shore, can, by noticing the point of the compass from which the wind blows at the time of his being wrecked, be governed in his course across the island, where he will find himself under the lee of the higher land, and protected in some measure from the violence of the tempest. By keeping along the margin of the island, where the travelling is good, and before coming quite to the marsh, either north or south, he will be certain of meeting with one of these huts or houses, where he may find temporary relief. To facilitate still further the means of conveying immediate assistance to those unfortunate mariners who may be wrecked on this island, a number of gentlemen were incorporated for the purpose, and have completed a bridge and turnpike-road from Newburyport to Plum Island. This road leads in a south-easterly direction from Newburyport, and the bridge crosses Plum Island nearly about a quarter of a mile to the S.W. of Seal Island. An elegant hotel has been erected at the east end of the bridge, within 100 rods of the sea-shore, a mile south from the lights, and about three-quarters of a mile northerly from the northernmost house erected by the Merrimack Humane Society before mentioned. The hotel is painted white, has three white chimneys, and may serve as a landmark for seamen.

If a vessel, by stress of weather, should be obliged to run ashore on this island, and the master can make any choice of the place, it is most eligible to run on to, as nearly opposite this house as possible, as assistance and shelter can be more promptly afforded, and the communication will be more direct with Newburyport.

It rarely happens that any life is lost on this beach, in attempting to escape from the wreck, when the crew remain on board until low tide. Unless the vessel is in imminent danger of going to pieces immediately, the seamen should never take to their boat."

In a course nearly north from the lighthouses on Plum Island, and about half a mile distant, across the mouth of the Merrimack River, is the southern extremity of Salisbury Beach, named Salisbury Point. From this point a sandy beach extends northerly on the verge of the ocean, without an inlet or interruption of any consequence, until it reaches Hampton River. This beach is connected with the main land by a salt-marsh, of considerable extent, intersected by a variety of small rivulets and creeks, which render it impossible for a shipwrecked mariner to reach the inhabited part of Salisbury. Here, too, the hapless mariner is sometimes destined to suffer the misfortunes of shipwreck, and to reach a desolate and inhospitable shore, only to aggravate the horrors of his death. Even if he can attain the first and wished-for object in escaping from the dangers of the ocean, he then finds himself a solitary wanderer on the coast, without shelter or sustenance; and, in his fruitless search for them, must inevitably perish.

Although the N.E. storms are generally most fatal to vessels on this part of the coast, yet Salisbury Beach is not so frequently a place of shipwreck as Plum Island; but to guard against a possibility of accident, which must sometimes happen to the unskilful or inexperienced navigator, the Marine Society erected a hut, similar to those of Plum Island. Here they deposited everything necessary for the relief of such as might need it, and were at the pains and expense frequently to inspect it, and renew their generosity by replenishing it; but this has shared the same fate with those on Plum Island; not so much, however, from the insufficiency of its foundation, or the violence of the winds, as from the wantonness of individuals and companies, who frequent this spot, in the warm season, on parties of pleasure. The Merrimack Humane Society have extended their benevolent views to this part of the coast, and have erected a hut about three-quarters of a mile north from Black Rocks, so named, and about 150 paces from the sea-shore. This hut will be maintained in commodious repair, and provided with everything suitable for those who may be so unfortunate as to need its shelter. Others, on the same coast, will be erected as speedily as the funds of the society, and the charity of individuals, will render it possible, and will be conveniently furnished and provided for the same laudable purpose.

When a pendant is hoisted half-mast, the vessel may come in, keeping the lights a little open to the northward.

When a blue burgee is hoisted half-mast the vessel may come in, keeping the lights a little open to the southward.

When a vessel is seen in the bay, and does not get in before night comes on, the following lights will be made:—

For a vessel to keep off, and not to attempt to come in over the bar during the night, a lantern will be hoisted to the top of the flag-staff.

When there is proper time for a vessel to come in over the bar during the night, two lanterns will be hoisted, one at the top of the flag-staff, and the other half-mast high. The vessel must then lay off and on at the bar until a light is made in the eastern light-house, at a window about 8 feet below the lantern. The vessel may then come over the bar, keeping the lights in a line; and when she gets abreast of the upper light, there is good anchorage.

The signal for vessels in distress is a white square flag, with a large black ball in the centre, hoisted half-mast high."

From Newburyport to Ipswich Harbour the distance is about 7 miles along the east side of Plum Island, a narrow island, which is separated from the main land by a shallow sound. It is not more than 500 paces across, and its north end forms the south side of the entrance to the Merrimack River, while its south end is the north shore of the Ipswich River. That part of the island bounding the sea consists almost entirely of yellow sand, perfectly smooth on the beach, but, farther from the sea, driven by the wind into hillocks, or heaps of fantastic forms, and preserved in that shape by the successive growth of grass and shrubs. On the back part of the island, where it is washed by the sound, is an extent of salt-marsh, bounding its whole length. At the southernmost end of the island there are several houses, with families, and a considerable spot of land in good cultivation, northward of which is a grove of pine-trees 1½ mile in extent.

IPSWICH.—The mouth of the Ipswich River is fronted by a bar which frequently shifts, rendering the assistance of a pilot necessary to strangers. The navigable channel is shown by buoys, and on the shore opposite the end of Plum Island there is a lighthouse, 34 feet high, which shows a light flashing every 1½ minute at 40 feet above the sea, visible 12 miles. There is also a small beacon light at about 173 yards eastward from this, which is moved as the changes of the bar render requisite, in order that the two lights in one may be the leading mark over the bar. The usual depth on the bar is 7½ feet.

Unless bound to Ipswich or Annisquam, it is recommended not to get into a less depth off this part of the coast than 6 fathoms, as it is shallow a long way out. At about 2 miles south-eastward from the lighthouse at Ipswich, and midway between it and Annisquam, is the entrance to the River Essex, which is fronted by a bar, upon which the usual depth is 7 feet.

ANNISQUAM.—Annisquam is a barred harbour, to enter which the assistance of a pilot is always necessary. The depth in the channel is seldom more than 6 feet at low tide, and we believe that buoys mark its limits. On Wigwam Point, east side of entrance, there is a white lighthouse, 35 feet high, which shows a fixed light, visible 12 miles.

At about half a mile north-eastward from Wigwam Point, there is an islet (Davis's Neck) close to the coast, which forms with the shore eastward of it a little cove called Hodgkins, where is a depth of 5 to 3¼ fathoms. Northward of this half a mile, a ledge of rocks extends some distance from the land, and has its limits marked by a buoy; this ledge bears the name of Plum Cove Ledge, partly shows at low tide, and has close to its edge a depth of 5 fathoms.

ROCKPORT.—At about 3 miles north-eastward from Annisquam is Halibut Point, the northernmost point of the promontory forming Cape Ann; it is a bold rocky headland, having at a short distance from its base a depth of 6 fathoms, which rapidly increases to 12 and 16 fathoms, the latter being at ⅓ of a mile out. The coast on the east side of this point falls in to the southward and forms Sandy Bay, a bay having an extent of about one mile, and at the head of which is the harbour of Rockport. Over the surface of this bay is a depth, generally, of 12 and 14 fathoms, and it is to some extent sheltered against heavy seas from the south-eastward and eastward by Straitsmouth Island, Avery's Ledge, Little and Dry Salvages, and by the dangerous rocky shoal named Flat Ground.

Rockport is a small harbour, having a depth of 15 to 7 feet at low tide. It is formed by a pier or breakwater, and its entrance faces the north-east. It is seldom visited by foreign vessels, the sunken ledges eastward of it rendering it by no means easy of access by strangers. When running in, be careful to avoid the rock, just under the surface, at a short distance north-eastward from the pier-head.

At about a mile northward of Rockport there is a small anchoring place in the cliffs, termed Pigeon Cove. It has been formed by running out a breakwater from the land to a ledge of rocks dry at low water, by which means shelter has been obtained against north-easterly winds. The depth is 13 to 7 feet, and the space is very confined.

When running for Rockport from the northward, or from Rockport to Pigeon Cove, the shore at the head of Sandy Bay must be very carefully approached, because there are two ledges of rock, named Sandy Bay Ledge and Dodge's Rock, which are much in the way of vessels, and especially the latter, Dodge's Rock being nearly $\frac{1}{4}$ of a mile from the land. To avoid these rocks, do not go westward of the head of the breakwater or pier at Rockport bearing South.

When approaching Rockport from the eastward, care is necessary to avoid a sunken rock (12 feet) situate midway between the lighthouse on Straitsmouth Island and the harbour, at about $\frac{1}{4}$ of a mile from the coast. As there is a depth of 11 fathoms close to it, and $7\frac{3}{4}$ fathoms inside it; it is very dangerous, and should be marked by a buoy.

The instructions appended to the chart (U. S. Coast Survey) of Rockport, 1858, are: "Approaching the harbour from the southward, bring the northern lighthouse on Thatcher's Island to bear W. by N., and the lighthouse on Straitsmouth Island N.W. by N., as these marks will clear the Londoner; then steer N.N.W. $\frac{1}{2}$ W., passing about two cables' length northward and eastward of Straitsmouth Lighthouse. When this latter building bears S.W. by S., steer W. by N. until the large granite factory in Rockport comes W.S.W., when you should run for it on that bearing, passing midway between the points of the harbour, and anchor in 11 feet water, or pass between the buoys to the pier-head."

Straitsmouth Island.—This is a small islet separated from the shore by a very narrow and rocky passage of only 3 feet water at low tide. Upon its north-eastern extremity there is a white lighthouse 24 feet high, which shows a fixed light at 33 feet above the sea, visible 11 miles.

Avery's Ledge.—At about $\frac{1}{3}$ of a mile N.N.E. from the lighthouse on Straitsmouth Island, and separated from it by a depth of $5\frac{3}{4}$ to $6\frac{1}{3}$ fathoms, is a dangerous patch of rocks named Avery's Ledge. It has upon it only 4 feet water at low tide, and is marked by a buoy. Its edges are very steep, there being in its near vicinity soundings of 7 to 10 fathoms.

Salvages.—These are two patches of rocks situate one mile from the lighthouse on Straitsmouth Island, between the bearings of E. by N $\frac{1}{4}$ N. and N.E. $\frac{1}{3}$ E. The easternmost are above the surface, and hence termed Dry Salvages; the others are called Little Salvages. There is a depth of 5 fathoms close to these rocks, which rapidly increases northward and eastward to 20 fathoms, which is at a distance of not more than half a mile from them. Soundings of 43 and 46 fathoms have been obtained at two miles eastward from them, but the bottom there appears to be very uneven, as almost immediately afterwards, and further eastward, were some casts of 19 and 21 fathoms.*

To avoid the Salvages, and consequently the Flat Ground westward of them, do not approach this part of the coast nearer than the north lighthouse on Thatcher's Island, bearing S.W. $\frac{1}{2}$ S., unless you are bound to Rockport.

Flat Ground.—At $\frac{7}{8}$ of a mile N.N.E. $\frac{1}{3}$ E. from the lighthouse on Straitsmouth Island is [illegible]y marking the south end of a narrow shoal, named the Flat Ground, which thence extends nearly half a mile in a similar direction, with soundings upon it varying from 2 to 17 feet. Its north end lies with the extremity of Halibut Point, bearing W.N.W. $\frac{1}{4}$ N. $2\frac{1}{4}$ miles, and close to it are soundings of 5 and 6 fathoms, which rapidly increase to 16, 20, and 30 fathoms.

* It has been stated that at 7 to 10 miles from Thatcher's Island, in an East or S.E. direction, there are several stony spots of 10 to 18 fathoms' water, having on their western side a depth of 25 to 30 fathoms; but no such soundings were obtained by the U.S. Coast Surveyors when examining this part of the coast, although a bank of 20 to 30 fathoms was discovered, extending from 3 to 8 miles eastward of Straitsmouth I[illegible]nd, and separated from that island by a gully of 30 to 46 fathoms. See the chart of the coast.

CAPE ANN.—Cape Ann is of moderate height, and easily recognised when approaching from the eastward by the lighthouses on Thatcher's Island, that on Straitsmouth Island, and by Pigeon Hill, a hill which appears like a boat bottom upwards, situated about a mile southward of Halibut Point.

Thatcher's and Milk Islands.—Two small islands, Thatcher's and Milk, lie off Cape Ann, of which the former is most to seaward or towards the north-east. On Thatcher's Island there are two white stone lighthouses, 45 feet high, which show fixed lights at 98 feet above the sea, visible 16 miles; they are distant from each other 894 feet N. by E. ¾ E. and S. by W. ¾ W., and form an excellent mark for clearing the Salvages and other rocks in front of Sandy Bay.

Vessels should not attempt to pass between Thatcher's Island and the coast, because at about midway there is a ledge nearly awash with the surface, named Oak's Rock, which is, we believe, marked by a buoy; nor should they seek to run between it and Milk Island, that channel being also foul. As very slight shelter against easterly winds is afforded by the islands, and there is no safe anchorage near them, all others, besides small coasting vessels whose masters are well acquainted with the locality, should carefully avoid getting among these dangers by keeping well eastward of the Londoner Shoal.

Milk Island is low and but little above the surface of the sea. It is surrounded by a ledge of rocks which extends towards the coast, and leaves a very narrow channel of 3¾ and 4¾ fathoms between.

Londoner Shoal.—At rather more than ⅓ of a mile eastward from Thatcher's Island, and parallel to it, is the Londoner, a dangerous shoal ¼ of a mile in extent, the north end of which lies with the north lighthouse on that island, bearing W.N.W. ⅓ W., and the south end with the south lighthouse, N.W. ⅞ W. Part of it is dry at low water, but on other parts there is a depth of 9 to 15 feet at the same period of tide. Close to it are soundings of 3½ fathoms rapidly deepening to 14 fathoms, the latter being at not more than ¼ of a mile from its eastern side; between it and the shore is a depth of 5¾ to 7¼ fathoms. A beacon has been erected on the dry part of the rock.

Most shipmasters give the Londoner a very wide berth, and prudently so, but occasionally it may be convenient to pass between it and Thatcher's Island; a course which, however, should only be attempted with a very small vessel, and even then an intimate knowledge of the locality is desirable. If from the *north-eastward*, do not approach the shoal nearer than the south lighthouse, bearing W. ½ S.; and if from the *south-eastward*, nearer than the same object N.W. When through the channel, Milk Island, which is very low, and even in a clear night scarcely visible, may be cleared by not approaching the coast nearer than the south lighthouse, bearing N.E.

SHOALS (OUTLYING) OFF THE STATES OF MAINE AND MASSACHUSETTS.

Of the shoals which exist off the coast of the state of Maine, with the exception of Cashe's Ledge and the Great George's Bank, a survey has not yet been made; the particulars that we have been enabled to gather of them, must therefore be received with that caution which is proper to all uncertain information. Soundings on these banks have from time to time been obtained by the United States' coast surveyors, but we believe that no party has yet been assigned to this section for their systematic examination.

From Cape Sable to Cape Cod the distance is about 70 leagues. When sailing from one point to the other you will pass about 12 leagues southward of the Fippenies and Cashe's Ledge, and northward of the George's Banks.

FIPPENIES.—When sailing eastward from Thatcher's Island, after running a distance of 17 or 18 leagues, you will probably get soundings upon a bank 8 or 10 leagues in extent, named the Fippenies, which has a north and south direction, and is only about 6 miles in width. Upon this bank the soundings vary from 30 to 40 fathoms, and there are 80 and 90 fathoms close-to on its eastern side, deepening to 100 and 130 as you run to the south-eastward. The presumed longitude of this bank is 69° 25′ W., and it is stated to run from lat. 42° 40′ to 43° 3′ N.

The Fippenies Bank probably lies more eastward than the position indicated above, Lieut. T. B. Huger, of the Coast Survey Service, having obtained soundings of 36 fathoms, on the 17th of October, 1853, in lat. 42° 47′ N., and long. 69° 13′ W., at a

locality where 100 fathoms had hitherto been supposed to be the depth. The surface of the spot giving these soundings is about 3 miles in extent from North to South, and 2 miles from East to West, and immediately around it are 38 and 40 fathoms. Lieut. Huger says, "On the 17th inst., I touched the bottom in 40 fathoms, and endeavoured to follow the line of soundings. I was struck with a strong tide-rip, in appearance the same as those off the Nantucket Shoals, trending to the northward and westward. I ran one line along the eastern edge, sounding in 36, 38 and 40 fathoms, another line through the middle of it, and before leaving the ground, a line on the southern edge. I am disposed to think that there are several different knolls, with a depth varying from 30 to 70 fathoms, not now laid down on the chart. The character of the bottom, as far as I was able to obtain it, was coarse sand in the 30 fathoms water, and soft mud in the deeper parts."

CASHE'S LEDGE.—This ledge lies about 15 miles eastward of the Fippenies, and is situated on a bank of 20 to 40 fathoms water, the extent of which is not well ascertained. On the eastern side of this bank you will soon get into deep water, and there are soundings of from 89 to 90 and 100 fathoms between it and the Fippenies. What renders Cashe's Ledge so dangerous is a flat white rock, in extent about 300 feet, which is situated on the eastern edge of the bank, and has 26 feet or less water upon it. South of this rock there is said to be a gully of 90 fathoms water running in upon the bank in a south-westerly direction, upon the south side of which, at 3 miles southward of the flat white rock, there is a shoal of 7 fathoms, having immediately around it soundings shoaling suddenly from 15 to 30 fathoms on all sides except the east, when it deepens suddenly to 80 and 90 fathoms.

At about 9 or 10 miles to the N. by W. of the flat white rock, and separated from it by soundings of 10 to 35 fathoms, rocky bottom, there is a shoal of 11 to 14 fathoms, bottom of kelp.

Cashe's Ledge has been described by several navigators; but, until sought for by Commander Davis, of the U.S. Navy, (a copy of whose report is given subsequently,) its position was not very accurately ascertained. Commander Owen, R.N., a few years since, ran a line of soundings of 40 to 45 fathoms across the bank, in a north-westerly direction, but was unsuccessful in finding the 26 feet rock, although we believe his search was repeated several times.

The following description of Cashe's Ledge by the Master of H.M.S. Beaver, was written some years since; it will be observed that the latitude and longitude he assigns to it are incorrect, according to the more accurate determination of Commander Davis:—"I took my departure from Thatcher's Island, eastward of Cape Ann. The island bore North from me, distant 3 miles. From this bearing I steered E. ¾ N., with a fair wind, 65 miles, and fell in with the bank where Cashe's Ledge is, about 2 leagues to the northward of the shoal, in 60 fathoms water, hard black clay. This bank extends from North to South 7 leagues, and from East to West 2 leagues. In the middle of the bank is the shoal mentioned: its length and breadth is about half a mile. It is rocky, and its soundings very irregular, having 10 to 4 fathoms in the length of a boat. You will have 17 fathoms of water within a cable's length of it, deepening as you stand from it, to 90 fathoms. As you approach the bank, you sound in from 60 to 35 fathoms, brown sand, with black stones and broken shells: then in 30 fathoms it grows rocky. The current on the ledge is exceedingly rapid and unaccountable. If the wind blows strongly, any vessel would founder, although she should not strike on it. The situation of the ledge, by four days' good observation, is lat. 43° 1′ N., long. 69° 6′ W. As this is a very dangerous shoal, all ships should endeavour to keep clear of it. On the shoalest part are only 12 feet at low water."

It has since been said by Mr. Backhouse, Master of H.M.S. Argonaut, that this ledge extends north and south 7 leagues; the shoalest part being near the centre of the bank, extending a quarter of a mile each way. The ledge, he observes, bears from Cape Ann E. ½ N., 24 leagues, the shoalest part being in the latitude above mentioned. "You will have," he adds, "on this part from 10 to 4 fathoms, very irregular soundings, all rocky bottom. The current shifts all round the compass every hour, and runs at the rate of 2 miles an hour."

Commander Charles H. Davis, of the United States' Coast Survey, made the following report relating to the position of the rock at Cashe's Ledge, dated June 8th, 1849; hence we may consider that the locality is now fully determined:—

"The U.S. steamer Bibb remained at anchor on the rock from 5 h. on Tuesday, to 5 h. on Wednesday afternoon, during which time the boats were employed in repeated

examinations of the surface of the rock. The sea was smooth, the wind West, the weather perfectly clear, and the southern and western horizons well defined.

The latitude was determined—

First, by the meridian altitude of the moon with three observers, whose readings differed from each other less than half a minute. The meridian passage occurred at twelve minutes past midnight; the declination of the moon was 17¾° south, which, the night being remarkably cloudless, secured a distant horizon.

Second, by a meridian observation of the sun, with four sextants, the readings of which differed in the extreme but one minute. The latitudes given by the sun and moon differ from each other but one mile. The longitude was determined by three chronometers, from Messrs. Bond and Son, which were taken on board on Monday, and returned on Thursday; and were proved by the final comparisons on Thursday to have run correctly. Twenty-five observations, taken on the 5th and 6th, were used to ascertain this element, the mean of those of the 5th differing from those of the 6th, by only a second of time. Several sets, not employed in obtaining the reported result, were also taken for confirmation. Not being absolutely required, they were worked out with less care.

The latitude of the rock, by the meridian observation of the sun, is 42° 56′ N.

The longitude, the mean of both days, is . . . . . 68° 51½′ W.

The latitude and longitude of this rock, recently given by the best authorities, are 42° 44′, and 69° 03′, the former differing 12 miles, and the latter 12 miles, from the Coast Survey determination. Formerly the latitude and longitude of this spot were laid down at 43° 04′ and 69° 11′, the former 8 and the latter 20 miles in error. These errors, particularly in latitude, give additional value to our determination, and render its early announcement important to navigators. The least water on this rock is 26 feet; a less depth has been reported by the fishermen, but they sound with their fishing lines, not accurately marked, and having on them a lead of 3½ pounds only; not heavy enough to press down or pass through the thick kelp that covers the rock. The extent of rock, having 10 or less fathoms on it, is about half a mile in a N.W. by W. and S.E. by E. direction, and very narrow. It is surrounded by deep water at a short distance, particularly on the south-east-side, where the depth increases suddenly to 60 fathoms.

It is my wish that this should be called Ammen's Rock, in compliment to the officer by whose exertions, last summer, the means were afforded of discovering and correctly determining its position at this time."

JEFFERY'S BANK.—This is an extensive deep water bank, of 30, 40, 50, and 60 fathoms, 16 leagues in length N.E. and S.W., and 3 leagues in breadth; it is generally represented in the charts as commencing close to the southward of Mount Desert Rock, and extending to about longitude 68° 45′ West. Outside the bank the water deepens to 70 and 80 fathoms, and between it and the shores of America are soundings of 100, 70, 60, and 55 fathoms. It is believed that there are no sunken rocks on the bank sufficiently near the surface to be dangerous to navigation.

GREAT GEORGE'S BANK.—The bank was surveyed in 1821, under the orders of Captain Isaac Hall, by the U.S. schooner Science, and the sloop Orbit. The following is a copy of the report:—"There are properly four shoals on Great George's Bank; the whole of them are included between the latitudes of 41° 34′ N. and 41° 53′ 30″ N., and longitudes 67° 18′ W. and 67° 59′ W. Between them are 15 to 35 fathoms of water.

The largest, and on which is the greatest danger, is the most southerly and westerly. It is somewhat triangular, with a long and narrow spit running out from the S.E. angle. The S.E. point is in latitude 41° 34′ N., and longitude 67° 40′ W. The west point is in latitude 41° 42′, and longitude 67° 59′. The N.E. point is in latitude 41° 48′ N., and longitude 67° 47′ W. The eastern side of this shoal, although somewhat irregular, runs nearly S.S.E. and N.N W., having on it from 3 feet to 9 fathoms at common low water; it is composed of a great number of sand spits, very narrow, so that the width of a narrow vessel will make several fathoms difference in the depth of water. The general range of the spits is from S.E. to N.W. As there are no rocks, they are, consequently, liable to change, in some measure, their position and ranges. On their eastern edge, even in calm weather, unless it either be high or low water, the tides run with great rapidity, and form considerable breakers, when setting to the westward. This is accounted for by a knowledge of the fact, that directly on the edge of this shoal there are from 12 to 16 fathoms of water, so that the edge forms a sort of dam, stopping the force of the flood-tide, and over which the ebb falls.

When there was any considerable wind, we observed that the breakers were higher within the edge to the westward than on the edge; and I have no doubt that the water there was still shoaler, and that we should have seen the sand had it not have been for the heavy sea. The breakers were such, unless it were entirely calm, that it was impossible to go among them with boats; nor was it considered safe to attempt with vessels. For besides the danger of striking on the hard sand spits, the vessels would have been liable to have been filled by the breakers. Even on the eastern edge, and at nearly slack water, the vessels were, at times, nearly covered with them. It was, therefore, not thought necessary to attempt it, as the object of the survey—to ascertain if there was danger on the shoals, and the situation and extent of this danger—could be accomplished without the risk. Had not the sea been very smooth, and at high water, we should not have been able to have got on where we found only three feet, when reduced to low water. The prevailing wind was to the eastward; and I have no doubt that this place would have been bare, with any continuance of an off-shore wind. I think there are no rocks about the shoals. We had one cast on the S.W. side, which indicated rocky bottom in 15 fathoms; but I believe it to have been some sharp stone that the lead struck upon.

The centre of the northern shoal is in latitude 41° 53′ 30″ N., and longitude 67° 43′ W. It extends east and west, about 4 miles: the shoalest part, having 6 fathoms, is very narrow, and composed of hard sand; but there are not more than 12 fathoms of water for three miles to the southward of the above latitude. On the north side, at 2 cables' lengths from the shoal, the sloop dropped into 33 fathoms. The breakers on this shoal are very heavy; and when there should be a sufficient sea to endanger a vessel, they might be seen some miles, and heard at a considerable distance; and as the shoalest part is not more than a cable's length inside, and no danger near it, a vessel might avoid it.

To the eastward of the last-mentioned shoal, in lat. 41° 51′ N., and long. 67° 26′ W., is another small shoal, with 8 fathoms water, having, however, considerable breakers. There are but 17 fathoms for three miles to the northward of it; but very near to the eastward are 31 fathoms, and from 20 to 30 fathoms to the south and west.

The centre of the east shoal is in lat. 41° 47′, and long. 67° 19′. It is about 2 miles long from east to west, and has 7 fathoms water. To the southward there are but 17 fathoms for two miles; but in other directions there are from 20 to 30 fathoms.

The above shoals, I am confident, are all which are on George's Bank; their positions and sizes may be relied on, as well as the soundings which I have laid down; they were ascertained by a vast number of celestial observations, taken with good and well-adjusted instruments, on board the two vessels, and very carefully calculated. The rates of the chronometers were found by a transit instrument previously to sailing from Boston, and after our return; and all our observations recalculated for the small variation that appeared.

At anchor, in different places, and on different days, we determined the set and strength of the tides, and as nearly as possible, their rise and fall. The rise of them is from 1 to 1½ fathoms. They set round the compass every tide, setting S.E. every full moon, and running from 1 to 4 knots per hour, at a mile's distance from the breakers. The mean rate is, however, materially varied by the winds. They set strongest at W.S.W. and E.N.E., and which is, undoubtedly, the strength of the flood and ebb. From these causes and variety in the tides, arises a principal danger in approaching the shoals. When under-way about the shoals, in a few hours' time we found ourselves drifted far out of our reckonings; and to ascertain our situations, when both vessels were under-way, we took continued observations for the longitude by the chronometers, and, at the same time, double altitudes for the latitudes; which latter were calculated by Brosius's new and certain method. By allowing for the set of tides, as ascertained at anchor, the observations and reckonings agreed very nearly, so that the latitudes and longitudes of every place may be considered as certain. Should, therefore, any vessel fall in with these shoals, a knowledge of the course and strength of the tides will prove of the greatest importance; and they can, by the preceding facts, be calculated for any day and hour.

In proceeding from Cape Cod to the shoals, at five leagues from the light, there are 86 fathoms, muddy bottom. The water gradually deepens to 133 fathoms, and then decreases towards the shoals. In lat. 41° 51′ N., and long. 68° 11′ W., there are 90 fathoms; in lat. 41° 50′, and long. 68° 3′, there are 49 fathoms, sand and gravel, on the western edge of the bank; the water then shoalens fast; to the northward of the

shoal, in lat. 41° 59′, and long. 67° 52′, on the south side of the north channel, there are 60 fathoms, soft mud; in lat. 42° 2′, and long. 67° 51′, there are 102 fathoms; in lat. 42° 10′, and long. 67° 18′, there is no ground at 175 fathoms. To the eastward we did not ascertain the extent of the bank. At two miles southward of the S.E. point of the shoals, there are from 20 to 26 fathoms, which soundings continue 20 miles to the southward and westward. The bottom on the bank, so far as we examined it, is of such a narrow character, that it is difficult for a vessel to ascertain her situation by it; we often found a great variety of soundings, in a very short distance, such as sands of various colours, and differently mixed, coarse and fine gravel, pebbles of various colours, stones, sponge, and shells.

Notwithstanding this variety, some general character of the soundings may be useful. The mariner, therefore, will find to the westward of the shoals, and at some distance from them, the bottom to be coarse sand and gravel of all colours; to the N.W., a mixture of white, black, and yellow sand; to the north, black and white sand; to the N.E., chiefly gravel and pebble; to the east, fine white and yellow sand; and in lat. 41° 57′ N., and long. 66° 40′ W., some white moss; to the S.E. fine white and yellow sand; and to the south generally white sand. As the shoals are approached, in whatever direction, the soundings become coarse, and are frequently mixed with shells of different kinds. Near the shoal much of the bottom is pebbles; and to the east of the largest and most dangerous shoal, there are stones the size of hens' eggs, with moss and sponge on some of them.

Near the S.E. point are from 15 to 20 fathoms; prevailing character of the soundings, green shells, chiefly of the species called sea-eggs. If a vessel be far enough south to avoid danger, she will have no shells. The reports that rocks have been discovered on these shoals are undoubtedly incorrect: at the western part of the bank we saw, in strong tide rips, large quantities of kelp and sea-weeds, which, at a distance, had the appearance of rocks, but on sounding we found good water and a regular and clear bottom.

It will be seen, by the bottom, that the holding-ground is not good; but the vessels employed in the survey, by having a long scope of cable, frequently rode out a considerable gale of wind, for twenty-two hours, on the east side of the main shoal, and also to the windward of it; the sea breaking very high at the time, we being in 10 fathoms water. It may be worthy of remark that, at one cast of the lead, on examining the arming, I found one-third black sand, one-third white sand, and one-third green shells, in as distinct dimensions as they could be drawn."

This bank was again surveyed in 1837 by Commander Charles Wilkes, of the U.S. Navy, and from his report it would appear that the two shoalest spots are in lat. 41° 40′ 13″ N., long. 67° 44′ 10″ W., and lat. 41° 40′ 33″ N., long. 67° 44′ 30″ W., and that these consist of knolls of hard sand, having on them at low water only 2½ fathoms, or 15 feet. Mr. Wilkes says in his report that "the whole of the shoal is composed of hard sand spits—fine sand on the shoalest places, and coarser as the water deepens, until it becomes large pebbles without sand.

The rise and fall of tides is 7 feet, extremely regular, the first part of the flood setting N.N.W., the latter part N. by E., and the ebb S.S.E. and S. by W. The flood runs 4½ hours, ebb 5½ hours; greatest velocity two and six-tenths of a mile, from half an hour to two hours in changing, going round with the sun on from north by way of east. The wind has but little effect on the velocity. High water, full and change, at 10h. 30m. Variation of the compass 8° 15′ W."

From this survey it would appear that the shoal is about 14 miles long and 1½ to 2 miles broad, the soundings being generally from 6 to 8 and 10 fathoms. As noticed above, the sea sometimes breaks heavily on it.

LITTLE GEORGE'S BANK.—It is probable that south-westward of the Great George's Bank there is another shoal, although, we believe, of not so dangerous a character, a patch of 5 fathoms having been found in lat. 41° 15′ and long. 68° 0′. The sea breaks heavily upon it in blowing weather, and about it are supposed to be soundings of 13 to 25 or 30 fathoms, but these particulars are uncertain, as well as the position assigned to it. It is stated to lie S.W. by S. about 25 miles from the south end of the Great George's Bank, and to have a bottom of sand, gravel, and pebbles in its vicinity.

A shoal of 5¼ fathoms at low tide, named Roger's Patch from its discoverer, lies on the Little George's Bank in lat. 41° 11′ and long. 68° 25′, and consequently about 20 miles westward of the shoal just mentioned. It has been only partially examined, but is believed to have soundings of 20 to 25 fathoms in its near vicinity.

When approaching George's Shoals from the southward, soundings of about 90 fathoms will be obtained in lat. 40° 4′ N., if you are S.S.W. of the bank. If in lat. 40° 30′ N. and soundings are not obtained, it is pretty certain that you are eastward of the shoal, and should direct your course accordingly to clear it; the first soundings in that case will be in 75 to 60 fathoms. It has been stated that when steering northward, you will shoalen your water gradually to 20 fathoms, when you will be in lat. 41° 20′ N., which depth you will have for about 10 or 12 leagues either eastward or westward; but some recent charts represent a much greater depth than this.

We would here mention that numerous lines of soundings have been recently carried out to the George's Shoals from the coasts of Nantucket Island and Cape Cod, and that several reported shallow spots have been by these means ascertained to have no real foundation. See our chart "Cape Canso to New York," in which are incorporated the results of these examinations of the sea bottom.

CAPE ANN TO CAPE COD.

GLOUCESTER HARBOUR.—From Thatcher's Island, Cape Ann, to the eastern point of Gloucester Harbour, the distance is about 5 miles along a rocky coast. At nearly 1½ mile from Milk Island there is a small islet named Salt, situate close to the land, and from which a ledge runs out to the south-eastward, rendering caution necessary when navigating in its vicinity; there is also a little inlet at about a mile before you get to the east point of Gloucester Harbour, named Brace's Cove, in which the depth is from 17 to 2 feet, but as it is a very confined place, with rocks on both sides, vessels can only anchor in it when the wind is from the land. The soundings off this shore appear to be irregular, but at a mile from the coast average 13 to 17 fathoms.

Gloucester Harbour is about 1½ miles wide at the entrance, and runs in about 2½ miles in a north-easterly direction. The town is at the head of the bay, and here is situated the inner harbour, where vessels of a light draught of water generally anchor; this harbour is formed by opposite points of land nearly meeting, and thus enclosing a large sheet of water, in which is a depth of 24 to 2 feet at low tide. The soundings in the outer harbour gradually decrease from 7¾ to 3¼ fathoms, on a bottom of sand, mud, and occasionally broken shells.

Lights.—On the east point of Gloucester Harbour there is a lighthouse 33 feet high, which shows a fixed light at 60 feet above the sea, visible 13 miles. A bell is sounded in foggy weather.

On Ten Pound Island (an islet within the harbour) there is also a small lighthouse showing a fixed light visible 12 miles.

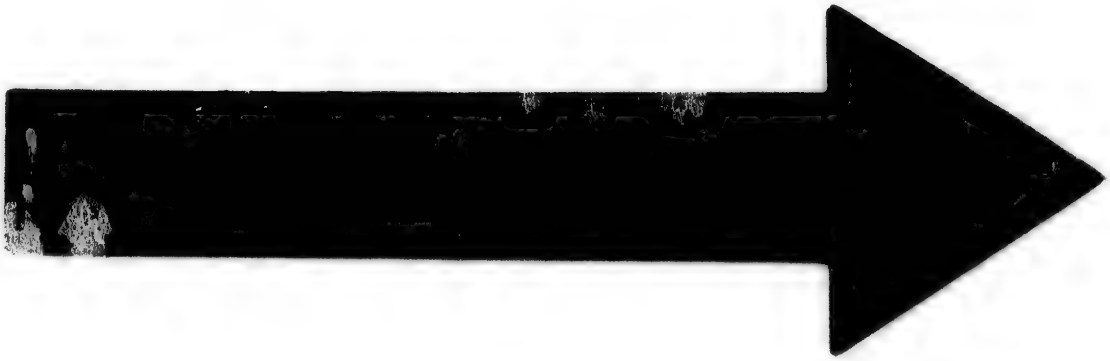
Rocks and Shoals.—Gloucester Harbour is far from being free from rocks and sunken dangers, as a ledge extends out from East Point in a forked form some distance, upon which (with the exception of the southern prong) is a depth of 7 to 18 feet at low water. The *southern* prong, or East Point Ledge, runs out from the lighthouse nearly ¼ of a mile in a S.W. ½ S. direction, and has near its extremity a very dangerous rock, named Webber's, which is awash with the surface, or nearly so, when the tide has fallen; the depth close to this part of the ledge is 3¾ fathoms, which rapidly increases seaward to 7 and 8 fathoms. The *northern prong*, or Dog Bar, extends from the lighthouse about N.W. by W. rather more than ⅓ of a mile, and has upon it 5 to 18 feet, gradually increasing towards its extremity; outside this prong, and in the same line of direction from the lighthouse, is the Round Rock, situate in the middle of the harbour.

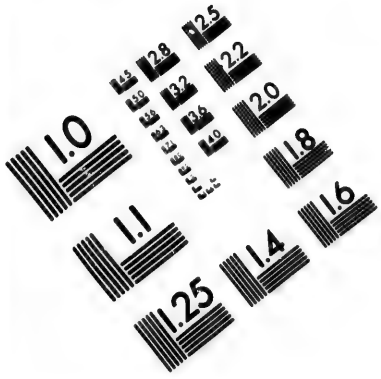
Round Rock.—Upon the most elevated part of this shoal is a depth of 13 feet. This spot lies in line with and midway between East and Muscle Points, and from it East Church appears just open to port of the lighthouse on Ten Pound Islet.

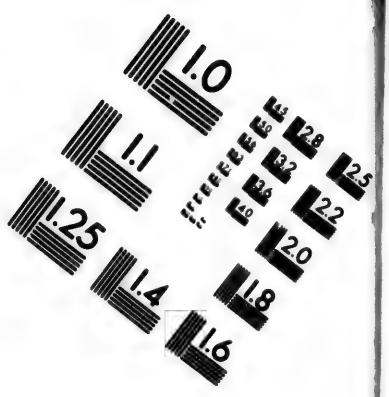
Norman's Woe is a high rocky islet on the west side of the harbour. It is situate W. by N. from the lighthouse on East Point, and from it a ledge of 7 to 16 feet extends out south-eastward ⅓ of a mile.

Ten Pound Island Ledge.—This is a small rock of 12 feet water, situate in the middle of the harbour at about ⅓ of a mile S.W. ¾ W. from the lighthouse on Ten Pound Island. Close to it is a depth of 5¾ fathoms.

Ten Pound Island is surrounded for a short distance by a ledge, and a rocky ledge







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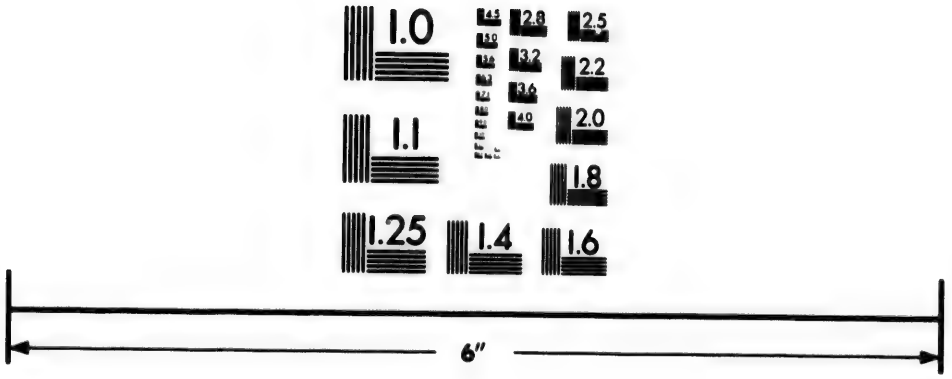

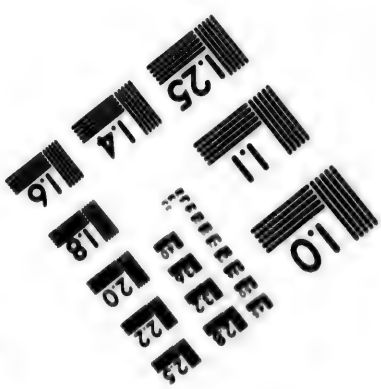

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also extends towards it from the eastern shore, leaving between only a very narrow channel of 10 feet water.

Field Rocks.—These are on the western side of the harbour at ¼ of a mile from the shore, and half a mile westward from Ten Pound Island. They are above the surface at low tide.

Babson's Ledge.—This is a rock of 13 feet water, lying about 200 yards southward from Fort Point, the west point of the inner harbour. There is no safe passage between it and the point.

Pinnacle Rock.—This rock is just within the entrance of the inner harbour, at about 80 yards south-westward of the Spindle Rock off the large wharf. It rises to a point, over which are only 9 feet at an ordinary tide, and there is deep water around it at not more than 10 feet from its centre.

Most of the rocks in and about the harbour are marked by spindles or buoys, at least those in the way of shipping.

DIRECTIONS.—When running for Gloucester Harbour from the north-eastward, the coast between Thatcher's Island and East Point may be approached to within a mile in 15 and 20 fathoms water. With the lights on that island in range, bearing nearly N. by E. ¾ E., distant one mile, steer S.W. by W. ½ W. 5 miles, till East Point Light bears almost North, and then haul round the point to the northward and westward, keeping half a mile from it to avoid Webber's Rock and the Dog Bar Ledge.

If intending to anchor in the South-east Harbour, the anchorage south-eastward of Ten Pound Island, where is a depth of 5 to 3¾ fathoms on sand, mud, and broken shells, bring the lighthouse on Ten Pound Island to bear N.N.E. ½ E., and steer thus until within half a mile of, or between it and Black Bess Point, when the course should be altered to E.N.E. ½ E. If it be desirable to run from this anchorage to the inner harbour, it should be remembered that the passage between Ten Pound Island and the eastern shore is too much obstructed by rocks to be available; but that a vessel of light draught may run between that island and Ten Pound Island Ledge, there being a depth, according to the Chart, of not less than 3¾ fathoms at low tide.

If intending to enter the inner harbour, bring Ten Pound Island Light to bear N.E., and steer N.E. ½ N., passing between Norman's Woe Rock and the Round Rock Shoal, and also between Field Rock and Ten Pound Island Ledge. When the light bears E.S.E., distant 300 yards, steer N.E. by E. ½ E. into the harbour.

MANCHESTER, BEVERLY, SALEM, AND MARBLEHEAD.—From Norman's Woe Rock, Gloucester Harbour, to the harbour of Manchester, the distance is about 5 miles, along a coast bordered with islets and sunken rocks, which lie at various distances from it. Manchester, Beverly, Salem, and Marblehead are all situate on the north shore of the great Massachusetts Bay, behind a multitude of islets, rocks, and sunken dangers, and are not, therefore, easily accessible. Most of the sunken rocks are marked by buoys; but although these have been very carefully arranged, so as to remove danger to vessels making the harbours as much as possible, it is highly imprudent for strangers to attempt to enter the channels unless assisted by some one well acquainted with the locality.*

Half-way Rock.—Of the various rocky islets just mentioned, that named the Half-way Rock is the outermost from the coast, and one of the most conspicuous. It lies about half way between the lighthouses of Thatcher's Island and Boston, hence its name, and nearly 2½ miles from the nearest land. It is 180 feet in diameter, 40 feet high, and has a depth of 12 fathoms or even more water immediately off it. On it there is a pyramidal beacon bearing a spindle 15 feet high, on which is a copper ball, 2 feet in diameter. The rock bears from the lighthouses on Baker's Island S. ¼ E. 2 miles.

Baker's Island is about ½ a mile in extent, and has a shallow flat of 8 to 10 feet, extending from its north-western side about ½ of a mile, close to which is a depth of 3 and 4 fathoms. On the island are two lighthouses, 29 and 52 feet high, bearing from each other N.W. and S.E., which exhibit fixed lights at 64 and 87 feet above the sea, visible about 14 miles; the southernmost of these is the highest. Near the east and south sides of the island are soundings of 5 and 3 fathoms, the latter depth being

* These harbours have been recently surveyed by the United States Coast Surveyors, and a very elegant chart of them has been published by the Office, at Washington, which should be in the possession of every one frequenting this part of the coast.

in the narrow passage separating the island from the Baker's Island Breakers, a channel which must only be attempted by those perfectly acquainted with the navigation. The island is represented as affording no convenient landing-place, and its northern and eastern sides are high and rocky.

Baker's Island Breakers.—These consist of an extensive flat which runs off from the south side of Baker's Island, a distance of $\frac{7}{8}$ of a mile in a S.E. by S. direction. On it there are from 2 to 6 feet water, and several of the rocks are dry, so that it is extremely dangerous, and must be cautiously avoided by all vessels approaching from the southward and eastward. Two of the rocks bear the name of the North and South Gooseberry, and another the Pope's Head. The edges of this flat are steep, there being a depth of 6 and 8 fathoms immediately off them.

Some reefs, called Outer and South-east Breakers, lie $\frac{1}{2}$ to $\frac{3}{4}$ of a mile from the outer edge of Baker's Island Breakers, in the direction of S.E. by S. $\frac{1}{4}$ S. from the lighthouses. They are marked by buoys, and have deep water in their immediate vicinity. To clear them keep southward of the line of bearing—Half-way Rock, W.S.W. $\frac{1}{4}$ W.; or do not go south-westward of the lighthouses bearing W.N.W $\frac{1}{4}$ W.

A rock named Searl's, with 9 feet of water over it at low tide, lies above $\frac{1}{2}$ a mile S.E. from the lighthouses. It is marked by a buoy.

Cat Island is a small island situate nearly a mile from Marblehead Neck, the point of land forming the eastern side of Marblehead Harbour. Its shore is irregular and rocky, and at its north-western end there is a high beach. On its southern side are three high rocks, two of which are connected with it by bars of sand, uncovered at low water; the other stands boldly up within these two, but more southerly.

On the north end of Cat Island there is a large white building used as an hotel, the cupola of which bears S.W. by W. 2 miles from Baker's Island lights. There is also a spar, surmounted by a cask, on the island.

Archer's Rock.—At about $\frac{1}{4}$ of a mile westward from the north end of Cat Island, there is a small rock of 15 feet water, named Archer's. It has a depth of 4 and 5 fathoms close to it, and is marked by a buoy, the position of which is W. $\frac{1}{4}$ S. from the hotel on the island.

Martin's Rock and Brimbles.—At $1\frac{1}{2}$ cable's length from the east side of the north end of Cat Island there is a dangerous patch of 20 feet water, named Martin's Rock, which is marked by a buoy, and nearly midway between the island and the north Gooseberry Rock, there is a patch of sunken rocks dry at low water, which is also marked by a buoy. These latter rocks, named the Brimbles, bear from the lighthouses on Baker's Island S.W. by W. $\frac{1}{4}$ W. distant $1\frac{3}{5}$ mile, and S.S.E. $\frac{1}{4}$ E. 3 cables' lengths from Eagle Island.

Satan Rock.—This is a black rock nearly level with the water situate half a mile eastward of Cat Island in the direction of Half-way Rock. It has a depth of 8 and 10 fathoms close to it, and is marked by a buoy.

Gooseberry Ledge is a small patch $1\frac{3}{4}$ mile S.S.W. $\frac{1}{2}$ W. from Baker's Island Lights. It has 15 feet water upon it, and is marked by a buoy.

Marblehead Rock is high out of the water, and will be at once recognised by the beacon upon it. It is situate $\frac{3}{8}$ of a mile S.E. by E. from the lighthouse on Marblehead Neck, and may be closely rounded on its eastern side.

Eagle Island.—This is a small island situated a little more than $\frac{1}{2}$ a mile north-eastward of Cat Island. It has a flat of 3, 6, and 12 feet extending from it $\frac{1}{2}$ a mile to the northward, upon which there are several dangerous rocks; its edges are also steep-to, so that it requires care to avoid. The north-western edge of this flat may be avoided by keeping Fort Sewall open northward of Gray's Rock; on this edge of the flat there is a spar-buoy.

Misery Islands are northward of Baker's Island, and two in number, namely, Great and Little Misery. They are connected to each other by a flat which also runs from them to the northern shore.

House Island is nearly $\frac{1}{4}$ of a mile eastward from Misery Islands, and on the east side of the entrance to Manchester Harbour. It is connected to the shore by a shallow flat.

These various reefs and islets are the principal of those situate in the approaches to Manchester, Salem, and Marblehead, and are the outermost or most to seaward. As it would be quite impossible for a stranger to run for these harbours without a pilot, it is unnecessary to particularize the remaining sunken dangers.

MANCHESTER HARBOUR.—The depth at low tide in this harbour is 6 to 3 fathoms on a bottom of hard sand and rocks. Fronting the entrance and almost midway between House and Great Misery Islands there is a sunken ledge dry at ⅓ ebb, named Whale's Back, which is marked by two buoys: and, within this is another rock, Sauli's, dry except at high spring tides, which is also marked by a buoy. Besides these buoys another has been placed on the edge of the ledge connecting House Island to the shore. In the harbour there is good shelter against almost all winds, but especially those from the northward.

When bound to Manchester steer W. by N. for the lighthouses on Baker's Island till within 1¼ mile of them, or till the beacon on Half-way Rock bears S.S.W. ¾ W. distant 2⅓ miles, when the course should be altered to W.N.W. until the east lighthouse bears S.S.E. ½ E.—steer now N. by E. ½ E. one mile, or till Ram Islands bear East, when you may anchor in 4 or 3 fathoms water. The latter course leads between the Whale's Back and Sauli's Ledges, and about midway between Great Misery and House Islands.

BEVERLY.—When bound to Beverly by the *Main Ship Channel* continue the W.N.W. course, as instructed in the directions for Manchester, until the hotel on Cat Island comes open west of Eagle Island, the east light on Baker's Island bearing at the same time S.E. by E. ½ E. Steer now W. by N. till the centre of Great Haste is in one with Marblehead Lighthouse bearing South, when the course should be altered to W.S.W. ½ W. in the direction of Juniper Point, till the beacon on Great Aqua Vitæ bears S. by W., and the east light on Baker's Island about E. by S., after which steer N.W. ½ W. till Juniper Point ranges with Naugus Head, then anchor.

If it be more convenient to approach Beverly by the *Cat Island Channel* steer for Half-way Rock, and pass it on either side at a distance of about 100 yards. Bring its beacon to bear S.E. ½ E. and then steer N.W. ½ W. till the South end of Eagle Island comes in one with the lighthouses on Baker's Island, bearing E.N.E. ¼ E., when you should steer N. by W. ½ W. till the beacon on Bowditch's Ledge ranges with the south end of Little Misery Island, and the east light on Baker's Island bears E. ¾ S. Steer now N.W. ½ N. till the centre of Great Haste bears South and in one with Marblehead Lighthouse, when you must proceed as before.

Beverly Harbour has a depth of 15 to 20 feet at low tide, but the space for anchoring is very limited. The assistance of local knowledge is necessary when choosing a berth. We believe that all rocks dangerous to navigation are marked by beacons or buoys.

SALEM.—If approaching Salem by the *Main Ship Channel*, steer as previously directed until Great Haste Islet comes in one with Marblehead Lighthouse bearing south, and then steer S.W. ½ W. into the harbour.

If the *Cat Island Channel* be preferred, continue as instructed for approaching Beverly until Great Haste Islet comes in one with Marblehead Lighthouse, after which the course is S.W. ½ W.

Salem Harbour has a depth of 4½ fathoms to 3 feet at low tide, and sufficient room for a large number of vessels. It is almost landlocked.

MARBLEHEAD.—If most convenient to approach Marblehead by the *Main Ship Channel*, steer as directed for Beverly, until the hotel on Cat Island opens west of Eagle Island, then change the course to W.S.W. until the east light on Baker's Island bears E. ¾ S., when you should steer South till the south end of Eagle Island ranges with Baker's Island Lighthouses, bearing E.N.E. ¼ E., and Marblehead Light bears S.W. ¼ S., then steer S.W. ½ W. into the harbour.

Cat Island Channel.—Continue as instructed for approaching Beverly until Marblehead Light bears S.W. ¼ S., when you may steer S.W. ½ W. into the harbour.

South Channel, or channel between Marblehead Rock and Cat Island. Bring Marblehead Light to bear N.W. by W., and stand for it till the lighthouses on Baker's Island bear N.E. ½ N., then steer N.W. ½ N. till Marblehead Light bears S. by W. ½ W., when the course is S.W. ½ W. into the harbour.

Marblehead Harbour is about a mile in extent S.W. and N.E., and half a mile broad. It has a depth of 4 to 2 fathoms on a bottom of hard black mud, and buoys mark the most prominent dangers, so that but little risk is incurred when running in. On its north-western side is Fort Sewall, and on its south-eastern side a lighthouse 23 feet high, which shows a fixed light at 43 feet above the sea visible 12 miles.

NAHANT PENINSULA, &c.—When running from Marblehead southward a good berth must be given to Tom Moore's Rocks, a ledge jutting out from Marblehead Neck, at

nearly ¾ of a mile from the lighthouse. It has a depth of 4 fathoms close to its extremity, is bare at ½ ebb, and marked by a buoy.

Tinker's Island.—This is a small rocky islet lying off the south end of Marblehead Neck, to which it is joined by a sandy flat, nearly dry at low water. At about ¼ of a mile south-westward from its south end, and separated from it by soundings of 3¾ to 9 fathoms, is a rock named Roaring Bull, which is marked by a buoy.

Pig Rocks, Ram Islands, Sammy's Rock, &c.—These are all situated at various distances from the shore between Marblehead Neck and Phillip's Point, the north point of Nahant Bay. The Great Pigs, the outermost of these rocks, is as much as 1½ mile from the land, and there being deep water in their immediate vicinity, great care is requisite when passing along in thick weather.

Nahant Bay, on the north side of Nahant Peninsula, has a depth of 12 to 7 fathoms, the latter being at about 1¼ miles from the shore, and almost close to the edge of a shallow flat of 12 to 7 feet, which thence extends westward to the beach. The north point of the bay (Phillip's Point) has a rocky ledge jutting out from it some distance. There being no shelter in the bay, vessels should only anchor in it with winds from the land.

Egg Rock.—In front of Nahant Bay there is a small rock, named Egg, upon which is a lighthouse, 25 feet high, which shows a fixed light at 87 feet above the sea, visible 8 or 10 miles.

Nahant Peninsula.—The Nahant Peninsula, or Rock, as it is sometimes called, is about 2 miles in extent, and connected to the shore at its northern end by a low beach, dry at low water. This low beach is scarcely broader than is sufficient for a good horse-path, and rendered almost impassable by the sea-weed with which it is thickly covered. On the seaward side of this beach, there is an extensive strand of sand, which at low water is as smooth and hard as marble; for three miles it stretches away without shell or stone, a surface of the finest sand, so hard that the heaviest waggons scarcely make an impression on it. The peninsula is a place of great resort in the summer season to the inhabitants of the neighbouring districts, its attractiveness being heightened by a readiness of access to it from all parts of the Northern States.

LYNN HARBOUR.—Nahant Peninsula forms, with the coast on its western side, a large shallow bay, the upper part of which takes the name of Lynn Harbour. Lynn is a la.ge and flourishing town situate at the head of the harbour, which is much resorted to by the smaller class of coasting vessels. Shoals dry at low water occupy the whole of the harbour, leaving between them narrow channels of generally only a very moderate depth. The depth on the bar is only 2 feet when the tide is out.

When approaching Lynn Harbour from the eastward and coasting along the south-west side of Nahant Peninsula, care is required to avoid a sunken rock named Bass, which lies about midway between Nahant Head and Bass Point, the south-east and south-west extremities of the peninsula, at nearly half a mile from the shore. It has a depth of 6 and 7 fathoms close to it and is marked by a buoy.

There is good anchorage in front of Lynn Harbour in 5 or 6 fathoms, where vessels may ride in bad weather. The mark is the hotel on Nahant Head, E.N.E.

BOSTON HARBOUR.—From Lynn Harbour to Cohasset Rocks on the south side of Boston Bay the distance is about 12 miles, and between is the harbour of Boston, which, although it affords a sufficient depth of water for the largest ships, is far from easy to enter by reason of the numerous islands and reefs scattered over its surface. The assistance of a pilot is therefore always necessary, and strangers ought not to attempt to run in without.*

The islets and sunken rocks in Boston Bay are separated by channels of various depths, and are moreover so thickly scattered about that an attempt to describe them in detail would be useless. Suffice it then to say that there are three principal channels, Broad Sound, Main Ship, and Back or Western Way, and that these are entered through several minor channels, of which those named North, South, Hypocrite, and Black Rock, are most important to mention.

Lights.—The lighthouse on Brewster Island is 66 feet high, and coloured white, and shows a light flashing every 30″ at 100 feet above the sea, visible 15 miles. There is also a screw pile lighthouse on the west end of the Spit or Brewster Bar,

* The harbour has been recently examined by the officers engaged in the survey of the coasts of the United States, and a chart, the result of their labours, has been published. This chart should be in the possession of every one frequenting the port.

abreast the Narrows, which shows a red fixed light at 35 feet above the sea, visible 7 miles.

In addition to the light on Brewster Island, and that on the Spit, just mentioned, there is a lighthouse on the north-east end of Long Island, one of the islands in Boston Bay, westward of Brewster Island. It is of iron, 22 feet high, and shows a fixed light at 80 feet above the sea, visible 15 miles.

Rocks and Shoals.—The principal dangers in and about Boston Harbour are the rocks and ledges near the shore, under the surface, and surrounded by deep water. They are all distinctly marked on the chart we have referred to, and shipmasters ignorant of the locality are earnestly entreated not to approach them without a pilot. The following are particularly to be avoided. *Outside.*—Davis's Ledge near the Minots; Martin's Ledge and Tewksbury Rock, near the Outer Brewster Island; and Maffitt's Ledge, north of the Devil's Back; which are dangerous to vessels beating into Boston Bay and Broad Sound. The rule is, firstly, to keep eastward of Cohasset Light bearing South; secondly, not to approach the Outer Brewster nearer than ¾ of a mile on the east side; and, thirdly, to keep westward of Maffitt's Ledge, giving it a good berth when passing. *Inside.*—Nash's, Kelly's and Tower Rocks.

Directions.—*If from the eastward,* endeavour to keep in about lat. 42° 20′, as you will then be on the parallel of Boston Harbour; or, should you be in the immediate vicinity of Cape Cod, bring the lighthouse on Race Point to bear South, 3 miles, and steer N.W. ½ W., as that course will carry you well clear of Cohasset Rocks to a position in front of Brewster Island Lighthouse, whence the harbour can be entered by the instructions subsequently given. When following the latter course it is necessary to keep northward of the direct bearing (N.W. ½ W.) if the wind be N.E., and westward of it if it be S.W., and make in all cases allowance for the set of the tide; with a leading wind and flood tide the direct course may be made good, but not so with the ebb, as that sets towards Minot's Ledge Light.

If from the north-eastward or vicinity of Cape Ann, no particular instructions are necessary, for unless the weather be very thick, the various lights of Thatcher's Island, Gloucester Harbour, Baker's Island, and Egg Rock will prevent too near an approach to the land; in any case the lead should be freely hove. In the almost improbable event of getting close up to Cohasset Light without having seen those just mentioned, steer from the coast with it bearing South until the depth of 15 to 17 fathoms is attained, when you may steer W.N.W. for Boston Light.

It may here be remarked that the bottom in the vicinity of Cape Ann is rocky, but towards Cape Cod fine sand.

To Clear Shoals outside the Channels.—To keep eastward of Davis's Ledge, Cohasset Rocks, keep northward of the line of bearing of Cohasset Light West. To go north of Harding's Ledge steer N.W. from the light on Minot's Ledge, Cohasset Rocks, until Point Allerton bears W. ¼ S. when you may steer W.N.W. into Nantasket Roads; but make allowance for wind and tide.

From Nahant Head, if bound for the Main Ship Channel steer S.S.E., or such a course as will give the Graves Rocks a berth of half a mile, passing them on their eastern side; and, from the Graves steer S.S.W. or S. by W. ¼ W. until up with the bearing that takes you into the channel. When steering the latter courses great care is required to avoid Tewksbury Rock (10 feet) and Martin's and Boston Ledges, which latter are marked by buoys.

If convenient the Graves may be passed on their western side by giving their south-west point a berth of a cable's length.

Tacking in Boston Bay.—A vessel working up to Boston Harbour in the day, may safely stretch anywhere from Minot's Ledge (Cohasset Rocks) to Nahant Head, until up with the Graves on the one side and the Hardings on the other. The north-east part of the Graves must not be approached nearer than half a mile, but the Hardings may be approached close to the buoy. Inside of the line from the Graves to the Hardings vessels may stand to the southward to within half a mile of the shore, and to the northward to within ¾ of a mile of the east end of the Outer Brewster, or the east end of Egg Rocks.

When up with Egg Rocks vessels must not go further northward than to bring Boston and Long Island Lights in one, and when passing Point Allerton must be careful not to go inside or southward of the buoy. A stranger may beat up to the anchorage inside the light on Brewster Island in the *day* by making short tacks, and keeping at about two cables' lengths from that island, and there wait for a pilot.

When working up to the harbour in the *night* the rocks off Cohasset, and also Harding's Ledge will be avoided by not going south of the bearing Brewster Island Light W.N.W. When within two miles of that light, vessels must not go farther northward than to bring it to bear S.W. ½ W.,* and when near Egg or Shag Rocks they must not pass northward of Long and Brewster Islands Lights in range.

Main Ship Channel.—After making Boston Light (that on Brewster Island) if the weather be bad, or the vessel one of heavy draught, it must be brought to bear W.N.W. to approach it, as this will lead southward of Thieves' Ledge and northward of Harding's Ledge. A vessel of light draught may run for it when bearing anything between S.W. and W.N.W., until within ¾ of a mile of the light, when it must be brought to bear W.N.W. to enter the channel. When abreast of the lighthouse bearing North, and in mid-channel, or halfway between it and Point Allerton buoy, a W. ¾ N. course made good leads to the beacon on False Spit, but if the tide be ebb or the vessel on the north side of the channel, steer West or West southerly, to avoid going on False Spit. The beacon on that spit must be left on the starboard hand. The course by George's Island is N.W. ½ W.† with the beacon on Nick's Mate and the middle of the monument on Bunker's Hill in range, until up with the eastern end of Gallop's Island. From this point the course through the Narrows is N.W. by N., keeping in mid-channel and steering for the high land on Deer Island until up with Nick's Mate, which is left on the port hand. Nick's Mate should be passed with Deer Island Beacon on with the north-east end of Apple Island by a vessel of light draught, and with it on with the south end of the island by a vessel of heavy draught, to avoid the shoal ground about it. As soon as Nick's Mate is passed steer W. ½ N. into President Roads, and continue thus until the west side of Long Island is just clear of the north-east bank of Spectacle Island, when the course must be changed to N.W., keeping this range on until abreast of the buoy on the south-east part of Bird Island. This range leads safely by the Lower Middle, Castle Island Rocks, Governor's Island Point, the Upper Middle, and in the best water over the shoal ground above the Upper Middle. When up with the buoy on Bird Island the course is N.W. by W. ½ W., towards the State House, until abreast of the buoy on Slate Ledge, and then N.W. by N. for the anchorage.

Hypocrite Channel.—This channel is between the Outer Brewster and Sunken Rocks, thence it runs between Green Island and Little Calf Island, and afterwards to Ram Head, where it enters Broad Sound Channel, leaving the buoys on Half-tide Rocks, Devil's Back and Alden's Ledge on the starboard hand. It is unsafe to strangers.

If bound for this channel bring the Graves to bear North, and the south point of Green Island West, and thence steer for the passage between Green Island and Little Calf Island, through which you should run in mid-channel. After passing Green Island steer S.W. by W., keeping the south part of the Graves open southward of Green Island, until the light on Brewster Island is shut in with the Great Brewster, when the Half-tide Rocks, marked by a buoy, will have been passed; then haul up West towards Long Island Light, leaving the buoy on Alden's Ledge on the starboard hand. When up with the buoy at Ram Head leave it on the port hand at 50 fathoms distant.

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* Such are the instructions on the chart of Boston Harbour, the result of the survey made by the United States Coast Surveyors, and published at the Office, Washington, 1857; but we should say that the bearing S.W. ½ W. is safe only *beyond* the distance of two miles from the light, for the Shag or Egg Rocks, Boston Ledge, Martin's Ledge, and Tewksbury Rock are all within two miles of it. It appears to us from the chart that if vessels keep eastward of the line of bearing Cohasset Light S.S.E., they will clear all these dangers, and also the Graves Rocks; and that if intending to enter Nantasket Roads they must keep southward of the line of Long Island Light and Brewster Light in one, or southward of Brewster Island Light W. ½ N.

† This course, N.W. ½ W., leads over or close to a rock which has recently been discovered in the Narrows, in nearly mid-channel, and in about 4 fathoms water. Its position is so dangerous to navigation that it ought to be removed by blasting. The published report of it is as follows:—

"Tower Rock or Ledge, upon which many vessels are supposed to have struck, is much nearer False Spit, and the sailing line passes between the two rocks, the distance between them being 85 yards. The following are the bearings from it: False Spit beacon E. ¼ N. (N. 74° E.), Narrows Lighthouse N.E. ¼ N. (N. 33° E.), and Nick's Mate beacon N.W. ½ W. (N. 61° W.).

Ranges.—South-west corner of Nick's Mate beacon and Foundry Chimney in Navy Yard. False Spit beacon and Boston Lighthouse.

The rock is of irregular shape with a base of about 130 feet in circumference, and rises to a peak, with a depth on the crest of 17 feet at near low water, 15½ feet at spring tides low water."

Black Rock Channel.—This channel leads from the Main Ship Channel at the beacon on the Spit into the Hypocrite Channel, and is never used by large vessels except to avoid ice in the Narrows. It is narrow, dangerous, and unsafe to strangers.

On leaving the Main Ship Channel pass close to the beacon, and steer about N.E. for the outer point of Green Island, keeping George's and the west end of Pettick's well open. Both the flood and the ebb tides set across this channel. There is a passage on each side of Whiting's Ledge.

Broad Sound Channels.—Vessels intending to enter by the *South Channel* may enter the Sound anywhere between Nahant Head and the Graves, the course being Southward of West. When Nick's Mate bears S.W. by W. they may run for it. The range for this channel is Nick's Mate on with the middle of the northern and highest of the Blue Hills. The channel is short and straight; its range is perfect, and vessels of the largest draught may resort to it with safety and convenience at half or three-quarters flood, especially when going out. Vessels going out this way will leave Ram Head, Alden's Ledge, and Devil's Back buoys on the starboard hand; and Little Faun, Great Faun, and Barrel Rock buoys on the port hand, and when running out of Broad Sound will keep Egg Rock open of Nahant Head.

Vessels, even those of lightest draught, should not attempt the *North Channel* in bad weather; this channel passes nearer Deer Island than the South Channel, from which channel it is separated by a middle ground. The buoys are left in the same manner as those of that channel, except that on Barrel Rock, which, in going out, is left on the starboard hand. The range for this channel is the north head of Long Island, on which the lighthouse now stands, in line with the second bluff on the west side.

Back or Western Way.—This channel is used in light winds on the ebb, to escape being set out into the Sound at Nick's Mate or the east end of Lovell's Island. Leaving President Roads steer S.S.E. to run between Spectacle and Thompson's Islands keeping nearly in mid-channel and passing about halfway between Moon Island and the west end of Long Island. The bottom is soft in mid-channel. When well past Long Island the course is S.E. until Long Island Light is open southward of the middle head; it then changes to N.E. by E., leading about halfway between Bass Point and Rainsford Island. When well clear of Rainsford Island steer for the south part of George's Island, leaving the buoy on Rainsford Island Shoal and Wilson's Rock on the starboard hand, which will lead into Nantasket Road.

Nantasket Road.—If desirous to enter Nantasket Road from outside, when Boston Light, that on Brewster Island, bears North distant $\frac{3}{8}$ of a mile, steer W. $\frac{1}{2}$ S., which brings you up with the buoys on the Centurion; leave these on the starboard hand in passing, and steer W.S.W. until Long Island Light opens clear of the southwest part of George's Island, then haul up for the light, and run in for the anchorage.

COHASSET ROCKS.—From Boston Harbour the coast trends south-eastward to the Cohasset Rocks, which are a very dangerous cluster visible at about $\frac{1}{4}$ flood. They extend $1\frac{1}{4}$ mile from the land and have deep water among and near them, so that great care is necessary when navigating in their vicinity, especially as the trend of the coast is south-eastward. Vessels bound to Boston and meeting with strong north-easterly gales should give this coast a wide berth, and keep the lead going that a depth of 15 fathoms may be maintained. The bottom hereabout is very uneven, so that some judgment in taking soundings is requisite in thick weather; the lighthouse on the outer ledge of rocks is, however, a great guide to vessels passing.

Between the Cohasset Rocks and the land there is a narrow channel of 5 to 9 fathoms, named the Gangway, which can be used by small vessels. An intimate knowledge of the locality is requisite.

The lighthouse on the Outer Minots or Cohasset Rocks consists of a granite tower surmounted by a bronze lantern, the height of the whole being 112 feet. The light is *fixed white*, shown at 84 feet above the sea, and visible from a distance of 14 miles. The rock upon which this building is erected has an exposed part at extreme low water of only 30 feet area; the highest part being at ordinary low water only $3\frac{1}{2}$ feet above the tide level. At high water there are 10 or 12 feet over the rock, and some idea

of the difficulties encountered during the construction of the lighthouse will be apparent from the fact, that a landing can only be effected in fine weather after a continuance of westerly winds, and then only for a period of two or three hours. Boats cannot lie alongside the rock at any time when the wind is but light, on account of the swell, and a footing is obtained only with much trouble and danger. An easterly wind, however light, raises a sea which renders it impossible to approach the rock.

The Outer Minots should not be closely approached on their eastern side, because a reef named Davis's Ledge lies nearly half a mile from the lighthouse on an E. by S. ¾ S. bearing. It has we believe a depth of 16 feet over it at low tide, has soundings of 13 to 9½ fathoms close to it, and is marked by a black buoy.

SCITUATE.—Scituate is a small harbour about halfway between Boston and Plymouth, upon the bar of which is a depth of only 10 or 12 feet at ordinary tides. Its northern point of entrance, named Cedar Point, consists of a very narrow projection scarcely joined to the shore, having on the seaward side very foul ground; its south point is cliffy. Only a few vessels run into Scituate, the accommodation being very scanty.

At about two miles W. by N. from Cedar Point there is a meeting-house, and near the N.W. side of the harbour a farm-house with two large barns at a little to the northward. To enter the harbour, the mouth of which is nearly one-third of a mile wide, it is said that "you ought to bring the meeting-house or farm-house to bear about W. by N. from the middle of the entrance, and run in, on that direction, for the farm-house, until the bar is passed, which is a hard bed of stones and gravel, that does not shift. After you are over the bar, and upon sandy ground, haul up and anchor near the beach, on the south side of the harbour."

The coast northward of Scituate, between it and the Cohasset Rocks, is far from clear of danger, it ought, therefore, to have a wide berth given to it. The Cohasset Rocks are followed south-eastward by a number of small detached rocks, which bear the general name of Stellwagen's Ledges, and which are situate at various distances from the land. At about half a mile northward from the harbour a ledge of rocks, called Long Ledge, juts out from the shore ⅓ of a mile, and is succeeded immediately by deep water of 4½ and 5½ fathoms. There is also a small patch of 3¾ fathoms at about a mile N.E. ½ N. from the extremity of Cedar Point.

From Scituate Harbour the coast runs 8 miles south-eastward to Brandt Point, off which is Howland's Rock, a ledge of only 7 feet water, lying at 1¼ miles due West from the shore, with Gurnet Lights bearing S. ¼ E., distant 4¼ miles. Within this ledge, at the distance of three-quarters of a mile, is Egg Rock. These dangers are, we believe, marked by a buoy: close to their outside edge is a depth of 4 to 9 fathoms.

At about 3½ miles southward from Brandt Point, and 2 miles before you reach Gurnet Point, Plymouth, there is a very dangerous reef of 7 feet water, named High Pine Ledge, which extends out from the coast about a mile, and has soundings of 5 to 7 fathoms close to its extremity. It is, we believe, marked by a buoy.

PLYMOUTH.—Plymouth Harbour, 6 miles southward of Brandt Point, is formed on the north side by a long narrow neck of land named Salthouse Beach,* which extends southerly from Marshfield, and terminates at Gurnet Point, and on the south side by a smaller beach within, which juts off from the main land near Eel River, about three miles from the town.

The harbour may be known by a round hummock on its northern side, named Gurnet Point, upon which two small fixed lights are established; and on its southern side by a double high land, named the Monument. The Monument side is full of shoals and quicksands, which dry in several places; but on the Gurnet, or north side, there is a channel, in which vessels may ride safely with all winds except those from the eastward, during the prevalence of which it is necessary to run farther up the harbour, and anchor within Brown's Island, a sandy flat only just above water.

The lighthouses on Gurnet Point are of equal height, the lanterns being about 90 feet above the level of the sea: the lights are visible about 15 miles, and are

* On Salthouse Beach is one of the huts erected and maintained by the Humane Society of Massachusetts, for the reception and relief of shipwrecked mariners. There is a breach in the inner beach, which exposes the shipping, even at the wharfs, during an easterly gale.

so situated that they cannot be brought in a line when northward of them, unless on shore.

Strangers require the assistance of a pilot when bound into Plymouth, as the channel is subject to frequent changes. In the event of being unable to obtain one, the following instructions appended to the chart issued from the Office of the United States Coast Survey, 1857, may be useful.

"Approaching from the southward bring Gurnet Lights in range and run thus until you are half a mile from them, when the tree on Saquish Head will bear West. Steer now W. by S. till the tree bears N. ¼ E., and Duxbury Pier W.N.W. ½ W.; then W. ½ N. till Duxbury Pier bears N.N.E. ½ E., and the pier-head on Long Beach W.S.W. ½ W. If bound to Plymouth steer now S.W. ½ S., passing the latter pier-head at about 80 yards distant, and anchor when Gurnet Lights are shut in behind Long Beach.

If bound into Cow Yard, instead of adopting the last-mentioned course, S.W. ½ S., steer North half a mile, passing to port, or on the west side, of Duxbury Pier, and giving it a berth of 100 yards. Anchor in 4½ fathoms.

When beating into Plymouth Harbour do not stand into less than 3 fathoms on the northerly tack. On the southerly tack the best guide is the rips marking the edge of Brown's Island or Shoal, which can be distinctly seen except in very calm weather."

White Horse Lone Rock. The south point of Plymouth Bay is named Elisha's Point; it should not be closely approached, because a rock, known as the White Horse Lone Rock, lies off it at a short distance, in the immediate vicinity of which is a depth of 6½ fathoms.

Manomet Point. At 2¾ miles south-eastward from Elisha's Point, and 5¾ miles southward from Gurnet Point is Manomet Point, off which are the dangers termed the Mary Ann Rocks. These are from ½ to ¾ of a mile from the shore, and have a depth of 7½ fathoms close to outside them, and 5¼ fathoms in the narrow channel which separates them from the sunken ledge jutting out from the point.

A 6-feet sunken rock, named Stellwagen's Rock, has recently been discovered at about a mile from the shore, from which Manomet Point bears nearly North 2 miles. It has a depth of 5 and 7 fathoms in its immediate vicinity.

From Manomet Point southward, the shore of Cape Cod Bay is lined by a flat of 10 to 16 feet, which extends out in some places more than a mile. In other respects there is deep water over the whole surface of the bay, with the exception of the extensive Billingsgate Shoal, mentioned subsequently.

BARNSTAPLE.—The entrance of the port of Barnstaple bears nearly S. by W. 19 miles from Race Point Light, and S.E. ¾ S., 7 leagues from Plymouth Lights. There is a small fixed light on Sandy Neck, the west side of the entrance.

Vessels from the northward must not approach the bar nearer than 5 fathoms, until the lighthouse on Sandy Neck bears S.W. ½ W., for a long bar stretches out from the point fully 3 miles in a N.E. direction, on the eastern part of which is a buoy, lying in 2 fathoms water; the light bearing from the buoy N.E. ½ E., distant 3 miles. When up to this buoy, haul close round it, leaving it on the starboard side, and run about two cables' lengths S.S.W., to clear the south-west part of the bar, then steer S.W. by W. ½ W., for about 1½ mile, or until the light bears S.W. by S., which will be the case when you are up to Yarmouth Flats; then continue direct for the light. Always be careful to make the above courses good, for the flood-tide generally sets strongly over these flats, and the ebb runs equally strong to the northward over the bar. Continue for the light, until you get within a cable's length of the beach, and follow the shore round the point. There is safe anchorage inside, abreast of the light, with all winds; and with the light bearing from S.W. to N.E., you will have from 5 to 2½ fathoms. There is usually a depth of 6 to 7 feet over the bar at low water, and from 2 to 3 fathoms in the channel. Vessels drawing 8 feet water may, at high tide, bring the light to bear S.W. ½ W., and run directly for it.*

WELLFLEET.—On Billingsgate Island, at the entrance to Wellfleet Bay, there is a lighthouse 34 feet high, which shows a fixed light at 40 feet above the sea, visible 12 miles. The building has a square form, is coloured red, and bears a black lantern.

Wellfleet Bay has an extent of about 5 miles in a N. by E. direction, and a breadth of 2½ miles. Its western side is formed by a chain of islets, the southernmost of which is

* These instructions for the port are imperfect owing to some recent changes in the bar. Strangers must avail themselves of a pilot's assistance.

that bearing the lighthouse; all these are more or less connected together by sands dry when the tide is down. The surface of the bay is almost wholly occupied by shallow flats, even, or nearly so, with the surface at low water, and there are some rocks in the middle of the bay, bearing the names of Middle, Lumpfish, Wood's Beach, Sand, and Channel, the situations of which can be best seen by a reference to the chart; the most dangerous of these, or those most in the way of vessels, are, we believe, marked by buoys. Between these flats, and in a direction nearly parallel to the islets, is a channel averaging in depth $2\frac{1}{2}$ to $5\frac{1}{4}$ fathoms, access to which is over a bar of 7 feet. Vessels anchor in this channel and obtain shelter from almost all winds.

When running for Wellfleet Bay, it is necessary to give a wide berth to the western side of Billingsgate Island, because a shoal of 8 to 15 feet extends from it nearly $5\frac{1}{2}$ miles W. by S. $\frac{1}{2}$ S. from the lighthouse. This is the position of the buoy at its extreme point, but thence it gradually increases in breadth eastward until its base includes the whole of the islands forming the west side of the bay; consequently it forms a very prominent danger to vessels approaching from the northward. Although so dangerous to vessels bound to the bay, most excellent shelter from northerly gales can be obtained under it. Its edges are steep-to, especially on its southern side, where the lead will drop from 10 or 14 feet into $4\frac{1}{2}$ fathoms.

When bound to Wellfleet from Cape Cod, get the lighthouse on Race Point to bear East $1\frac{1}{2}$ mile, and steer S. $\frac{1}{2}$ E., maintaining at the same time a good lookout for the buoy on the extremity of Billingsgate Shoal. When up with it, pass it on the west side, and bring the lighthouse on Billingsgate Island to bear E.N.E., and then steer E. by N. $\frac{3}{4}$ N., until the lighthouse bears N.E. by E. $\frac{1}{2}$ E., at which time you will be 2 miles from it, and in a depth of 4 or $4\frac{1}{2}$ fathoms, sandy bottom, and should anchor.

When beating up the channel care must be taken not to approach too near Billingsgate Shoal, as the soundings decrease rapidly. Good anchorage may be obtained further in the bay in 3 or 4 fathoms water on soft bottom, at $\frac{4}{5}$ of a mile S. $\frac{3}{4}$ E. from the lighthouse, but the approach to it should not be attempted by vessels of burthen without a pilot.*

We believe that there is a small fixed light on Mayo's Beach at the head of Wellfleet Bay, visible about 5 miles.

Truro.—Northward of Wellfleet Bay, and at about midway between it and Provincetown, is the harbour of Truro, which is merely the outlet of a small shallow stream, dry, or almost so, at low tide. The bank lining the shore extends out opposite the river nearly a mile from the beach.

PROVINCETOWN.—Immediately under the extremity of Cape Cod is the harbour of Provincetown, which is justly considered to be one of the best harbours of refuge on the coast of the United States, as it contains a depth of 10 to $2\frac{1}{2}$ fathoms on good ground, and ample room for a fleet of the largest vessels, which may ride sheltered against gales and free from a heavy swell. The bay is almost landlocked, being open only to the south-eastward. Its extent from the lighthouse to the town is nearly $1\frac{1}{2}$ mile.

The north and east sides of Provincetown Bay are formed by the mainland of Cape Cod, and its west side by a low point of land (Wood End) jutting out south-eastward from Race Point, the extremity of the cape. On the extremity of this low point of land, named Long Point, there is a lighthouse 25 feet high, which shows a fixed light at 28 feet above the sea, visible 11 miles.

Vessels bound to Provincetown from the northward may run within a moderate distance of the lighthouse on Race Point; and having brought it to bear East half a mile, may steer S.S.E., about 4 miles, when the lighthouse on the Highlands will bear E. $\frac{3}{4}$ N., and they should run for it $2\frac{1}{2}$ miles, as it will bring them in the fairway of the harbour; then haul up N. by W. into the harbour, and anchor in 5 to 7 fathoms, with the lighthouse on Long Point bearing S.W. by S., or they may go further in and anchor with the lighthouse S.E. $\frac{1}{2}$ E.

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* These instructions for Wellfleet are according to the survey of Lieut. C. H. McBlair, since which the lighthouse alluded to has been removed, and a more substantial structure erected in its place. In the official notice announcing the erection of this building, it is mentioned that "the ranges remain the same as those published on the Coast Survey Chart of 1853 with the old lighthouse," but the latitude given, 41° 52′ 22″, differs 45″ from the position of the old building, 41° 51′ 37″, hence we suspect that it has been placed $\frac{3}{4}$ of a mile northward of it. If our surmise be correct, the ranges can scarcely be similar. In this case of doubt a prudent shipmaster will refrain from running for Wellfleet without a pilot.

When running from Race Point to Wood End, after the black land, or hummocks are passed, you will come up with a low sandy beach, which forms the harbour, extending between 2 and 3 miles to Wood End, which is difficult to be distinguished in the night; it is very bold, and you will have 25 fathoms within half a mile of the shore.

When beating into Provincetown Harbour, keep the eastern shore on board, until you get into 5 fathoms, standing no farther westward than to bring the light to bear S.E. ½ E., as there is a long spit of sand running off from the western shore, which is very bold, and with a depth of 11 fathoms within a stone's throw of the shore. In case it blows so hard that you cannot beat into the harbour, you will have good anchorage without, in from 10 to 15 fathoms.

If in Boston Bay, and you wish to run for Provincetown Harbour, endeavour to fall in with Race Point. If in the night, and you cannot see the land, bring the light on that point to bear E. by N., and run for it until you have soundings of 20 fathoms, when you will be half a mile from it, or what will be better, do not decrease the soundings below 28 fathoms, which will give an offing of a mile from the shore. From the latter position (the lighthouse E. by N. one mile) steer S.S.E. ½ E. until Long Point Light bears N.E. by N., when you should steer N.E. ½ E., until the same object bears W. by N. ½ N. and then N.W. into the bay, where you can anchor in 11 to 8 fathoms opposite the town.

When running along the coast from Race Point, care is required to give it a good berth, because a shoal named Shank Painter Bar, upon which is a depth of less than 16 feet, extends out from it ⅓ of a mile. It has soundings of 23 fathoms close to its edge, consequently the lead gives no warning of its close proximity.

Wood End must also be very carefully approached, being very steep, as almost immediately off it is a depth of 21 fathoms. Long Point equally requires a wide berth on its south-eastern side, a flat of 6 to 15 feet stretching out from it ¼ of a mile, which is immediately succeeded by deep water of 16 fathoms.*

CAPE COD.—Race Point, the extremity of Cape Cod, is low and flat, with marshes behind it. The lighthouse stands on a gentle rise of the land, close to the beach, and is a white building 28 feet high, which shows a fixed light flashing every 1½ minute at 35 feet above the sea, visible 11 miles. A fog bell has been placed at a short distance from the lighthouse.†

Vessels caught by a gale from the north-eastward may anchor under Race Point, at from ⅓ to ¾ of a mile from the lighthouse, in 10 to 4 fathoms water, and find shelter. The ground is stated to be moderately good for holding. It is not prudent to remain long, nor must the shore be closely approached, because the bank of 10 to 15 feet, running off from the beach, extends ¼ of a mile out and is steep. The harbour of Provincetown will be the best place to run for.

STELLWAGEN'S BANK.—This is an extensive bank of 13 to 18 fathoms fronting Massachusetts Bay, and situate almost immediately in face of the harbour of Boston. It commences at about 6½ miles N.N.W. from the lighthouse on Race Point, where is situate a small shoal spot of 9½ fathoms, thence it extends in a curved form, the curve being to the eastward, 18 miles in a northerly direction to its north end (13 fathoms), which is situate 16 miles S. by E. ½ E. from Thatcher's Island, Cape Ann. The soundings close to its edge are 30 to 20 fathoms, deepening rapidly eastward and westward, the 100 fathoms line being at little more than 10 miles from its eastern side. Between its northern end and Cape Ann the depth is 40 to 55 fathoms. It forms an extremely valuable guide to vessels making Boston in thick weather, as a single cast of the lead upon it, the soundings eastward of it being so deep, is sufficient to determine a vessel's position with some degree of certainty. It has been buoyed, a red buoy having been placed on the 9½ fathoms patch at its south end, a black and white one in the middle, and a black one at its north end.

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* It is remarked on the chart of the harbour, published by the United Coast Survey Office, 1857, that "Long Point Bar extends out ¼ of a mile N.N.E. from the lighthouse. The harbour is accessible with a N.E. wind, but care should be taken to keep close in along Long Point, and stand on the port tack towards Truro, until the harbour can be made on the other tack. Extensive flats lie eastward of the harbour along Truro shore; they shoal gradually, but the shore should not be approached nearer than one mile."

† The lantern of this lighthouse was refitted in 1855, and the official notice announcing the change omitted to mention the limit or degrees of arc of illumination. The old light was not visible seaward of the bearing from the ship of S. by W. ½ W., as it was established solely to guide vessels into Provincetown Harbour, that vessels caught in Boston Bay by an easterly gale might gain a safe anchorage.

CAPE COD TO LONG ISLAND SOUND.

From Race Point, mentioned in the previous section, the coast trends 9¼ miles in a curve to the Highlands, a range of hills 135 feet high, situate close to the sea beach, and remarkable for being the only land much raised above the sea level on the whole of the peninsula of Cape Cod; they are consequently visible at a considerable distance from all directions. When coasting along the beach should not be closely approached, because a flat of 7 to 15 feet extends out about ¾ of a mile and is almost immediately succeeded by deep water; this is especially the case along the north shore of the cape between the distances of 1½ and 6 miles from Race Point.

Highlands Light.—The lighthouse on the Highlands consists of a white tower 60 feet high, which shows a fixed light at 195 feet above the sea, visible 20 miles. Its position is lat. 42° 2′ 21″ and long. 70° 3′ 18″.* We believe that there is a telegraph station near the lighthouse which is in communication with the Merchants' Exchange News Room, Boston.†

CAPE COD TO CAPE MALABAR.—The following description of the coast from Cape Cod to Cape Malabar, pointing out the spots on which the Trustees of the Humane Society have erected huts for the relief of such persons as may be unfortunately wrecked on this part, is by a member of the Humane Society of America, and was written in the years 1804.‡

"The curvature of the shore, on the west side of Provincetown, and south of Race Point, is called Herring Cove, and is 3 miles in length. There is good anchoring-ground here, so that vessels may ride safely in 4 or 5 fathoms of water, when the wind is from north-east to south-east.

On Race Point, there are about a dozen fishing-huts, containing fireplaces and other conveniences. The distance from these huts to Provincetown Harbour is 3 miles. The passage is over a sandy beach, without grass or any other vegetable growing on it, to the woods, through which is a winding road to the town. It would be difficult, if not impossible, for a stranger to find his way thither in the dark; and the woods are so full of ponds and entangling swamps, that if the road was missed, destruction would probably be the consequence of attempting to penetrate them in the night.

Not far from Race Point commences a ridge, which extends to the head of Stout's Creek. With the face to the east, on the left hand of the ridge, is a sandy shore; on the right is a narrow sandy valley, beyond which is naked sand, reaching to the hills and woods of Provincetown. This ridge is well covered with beach-grass, and appears to owe its existence to that vegetable.

Beach-grass, during the spring and summer, grows about 2½ feet high. If surrounded by naked beach, the storms of autumn and winter heap up the sand on all sides, and cause it to rise nearly to the top of the plant. In the ensuing spring the grass sprouts anew, it is again covered with sand in the winter, and thus a hill or ridge continues to ascend as long as there is a sufficient base to support it, or till the circumscribing sand being also covered with beach-grass, will no longer yield to the force of the winds.

On this ridge, half way between Race Point and the head of Stout's Creek, the Trustees of the Humane Society have erected a hut. It stands a mile from Peaked Hill, a landmark well known to seamen, and is about 2½ miles from Race Point. Seamen cast away on this part of the coast will find shelter here; and, in north-east storms, should they strike to leeward of it, and be unable to turn their faces to windward, by passing on to Race Point, they will soon come to the fishing huts before mentioned.

At the head of Stout's Creek, the trustees have built a second hut. Stout's Creek

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* It has been recently stated that a wide berth ought to be given to this lighthouse on the Highlands, on account of landslips, which it is probable may form shoals off some part of the coast in its vicinity.

† This station was established in 1856, and it is said that vessels in the vicinity of the lighthouse will be immediately reported to Boston and elsewhere if they exhibit their telegraph numbers.

‡ This description of the coast, southward of Cape Cod, is still the best we have. It is very difficult to recognise in the charts of the Coast Survey the various localities alluded to, as but few of them are named. Cape Malabar is the name sometimes given to the south point of Monomoy Island. Since 1804 great changes have taken place in the coast line, and we believe that many of the huts are not now in existence.

is a small branch of East Harbour, in Truro. Many years ago there was a bed of salt-marsh on it, and it then deserved the name of a creek; but the marsh was long since destroyed, and the creek now scarcely exists, appearing only like a small depression in the sand, and being entirely dry at half-tide. The creek runs from N.W. to S.E., and is nearly parallel with the shore on the ocean, from which it is at no great distance. Not far from it the hills of Provincetown terminate; and should not the hut be found, by walking round the head of the creek, with the face to the west, the hills on the right hand, and keeping close to the shore on the harbour, in less than an hour the shipwrecked seamen would come to Provincetown. The Humane Society, several years ago, erected a hut at the head of Stout's Creek, but it was built in an improper manner, having a chimney in it, and was placed in a spot where no beach-grass grew. The strong winds blew the sand from its foundation, and the weight of the chimney brought it to the ground; so that, in January, 1802, it was entirely demolished. This event took place about six weeks before the *Brutus* was cast away. If it had remained, it is probable that the whole of the unfortunate crew of that ship would have been saved, as they gained the shore a few rods only from the spot where the hut had stood.

The hut now erected stands on a place covered with beach-grass. To prevent any accident from happening to it, or to the other hut near Peaked Hill, the trustees have secured the attention of several gentlemen in the neighbourhood.

From the head of Stout's Creek to the termination of the salt-marsh, which lies on both sides, and at the head of East Harbour River, the distance is about 3½ miles. A narrow beach separated this river from the ocean. It is not so regular a ridge as that before described, as there are on it one or two hills, which the neighbouring inhabitants call islands. It may, without much difficulty, be crossed everywhere, except over these elevations. By these hills, even during the night, the beach may be distinguished from those hereafter to be mentioned. It lies from N.W. to S.E., and is in most parts covered with beech-grass. The hills have a few shrubs on the declivities next the river. At the end of the marsh the beach subsides a little; and there is an easy passage into a valley, in which are situated two or three dwelling-houses. The first on the left hand, or south, is a few rods only from the ocean.

The shore which extends from this valley to Race Point, is, unquestionably, the part of the coast the most exposed to shipwrecks. A N.E. storm, the most violent and fatal to seamen, as it is frequently accompanied with snow, blows directly on the land; a strong current sets along the shore; add to which, that ships, during the operation of such a storm, endeavour to work to the northward, that they may get into the bay. Should they be unable to weather Race Point, the wind drives them on shore, and a shipwreck is inevitable. Accordingly, the strand is everywhere covered with the fragments of vessels. Huts, therefore, placed within a mile of each other, have been thought necessary by many judicious persons.

From the valley above mentioned the land rises, and at less than a mile from it the high land (or Highlands) commences. On the first elevated spot (the Clay Ponds) stands the lighthouse. The shore here turns to the south; and the high land extends to the Table Land of Eastham. This high land approaches the ocean with steep and lofty banks, which it is extremely difficult to climb, especially in a storm. In violent tempests during very high tides, the sea breaks against the foot of them, rendering it then unsafe to walk on the strand, which lies between them and the ocean. Should the seaman succeed in his attempt to ascend them, he must forbear to penetrate into the country, as houses are generally so remote that they would escape his search during the night; he must pass on to the valleys, by which the banks are intersected. These valleys, which the inhabitants call Hollows, run at right angles with the shore; and in the middle, or lowest part of them, a road leads from the dwelling-houses to the sea.

The first of these valleys is Dyer's Hollow, 1½ miles south of the lighthouse. It is a wide opening, being 200 rods broad, from summit to summit. In it stands a dwelling-house, a quarter of a mile from the beach.

At 1½ miles south of Dyer's Hollow, there is a second valley, called Harding's Hollow. At the entrance of this valley the sand has gathered, so that at present a little climbing is necessary. Passing over several fences, and taking heed not to enter the wood on the right hand, at the distance of ¾ of a mile, a house is to be found. This house stands on the south side of the road; and not far from it, on the south, is Pamet River, which runs from east to west through a body of salt-marsh.

The third valley, half a mile south of Harding's Hollow, is the head of Pamet Hollow. It may with ease be distinguished from the other hollows mentioned, as it is a wide opening, and leads immediately over a beach to the salt-marsh at the head of Pamet River. In the midst of the hollow the sand has been raised by a brush fence, carried across it from north to south. This must be passed, and the shipwrecked mariner will soon come to a fence which separates what is called the road from the marsh. If he turns to the left hand, or south, at the distance of a quarter of a mile, he will discover a house. If he turns to the right hand, at the distance of half a mile he will find the same house which is mentioned in the foregoing paragraph.

The fourth opening, $\frac{3}{4}$ of a mile south of the head of Pamet Hollow, is Brush Valley. This hollow is narrow, and climbing is necessary. Entering it, and inclining to the right, $\frac{3}{4}$ of a mile will bring the seaman to the house, which is situated at the head of Pamet. By proceeding straight forward, and passing over rising ground, another house may be discovered, but with more difficulty.

These three hollows, lying near together, serve to designate each other. Either of them may be used, but the head of Pamet Hollow is the safest.

South of Brush Valley, at the distance of 3 miles, there is a fifth opening, named Newcomb's Hollow, east of the head of Herring River, in Wellfleet. This valley is a $\frac{1}{4}$ of a mile wide. On the north side of it, near the shore, stands a fishing-hut.

Between the last two valleys the bank is very high and steep. From the edge of it, west, there is a strip of sand 100 yards in breadth. Then succeeds low brushwood, a $\frac{1}{4}$ of a mile wide, and almost impassable. After which comes a thick perplexing forest, in which not a house is to be discovered. Seamen, therefore, though the distance between these two valleys is great, must not attempt to enter the wood, as, in a snow-storm, they would undoubtedly perish. This place, so formidable in description, will, however, lose somewhat of its terror, when it is observed, that no instance of a shipwreck on this part of the coast is recollected by the *oldest inhabitants* of Wellfleet.

Half a mile south of Newcomb's Hollow is the sixth valley, called Pearce's Hollow. It is a small valley. A house stands at the distance of a little more than a $\frac{1}{4}$ of a mile from the beach, W. by S.

The seventh valley is Cohoon's Hollow, $\frac{1}{2}$ a mile south of Pearce's Hollow. It is not very wide. West from the entrance several houses may be found at the distance of a mile. This hollow lies E. by N. from Wellfleet Meeting-house.

At 2 miles south of Cohoon's Hollow is Snow's Hollow, the eighth valley. It is smaller than the last. West from the shore, at the distance of $\frac{1}{4}$ of a mile, is the country road, which goes round the head of Blackfish Creek. Passing through this valley to the fence, which separates the road from the upland and marsh at the head of the creek, a house will immediately be found, by turning to the right hand or north. There are houses also on the left, but more remote.

The high land gradually subsides here, and $1\frac{1}{2}$ miles to the southward terminates at the ninth valley, called Fresh Brook Hollow, in which a house is to be found a mile from the shore, West.

The tenth, $2\frac{1}{2}$ miles south from Fresh Brook Hollow, is Plum Valley, about 300 yards wide. West is a house, $\frac{3}{4}$ of a mile distant.

Between these two valleys is the Table Land.

After this there is no hollow of importance to Cape Malabar.

From Fresh Brook Hollow to the commencement of Nauset Beach, the bank next the ocean is about 60 feet high. There are houses scattered over the plain open country; but none of them are nearer than a mile to the shore. In a storm of wind and rain they might be discerned by daylight; but, in a snow-storm, which rages here with excessive fury, it would be almost impossible to discover them, either by night or by day.

Not far from this shore, to the southward, the trustees have erected a third hut, on Nauset Beach. Nauset Beach* begins in latitude 41° 51′, and extends south to latitude 41° 41′. It is divided into two parts by a breach which the ocean has made through it. This breach is the mouth of *Nauset* or *Stage Harbour*; and from the opening the breach extends North, $2\frac{1}{4}$ miles, till it joins the main land. It is about a

* On *Nauset Beach* there are three lighthouses, each of which is 18 feet high. They are distant from each other about 50 yards, and exhibit fixed lights at 93 feet above the sea, visible 10 miles. Their position is lat. 41° 51′ 37″ and long. 69° 56′ 44″ W.

furlong wide, and forms Nauset Harbour, which is of little value, its entrance being obstructed by a bar. This northern part of the beach may be distinguished from the southern part by its being of a less regular form. Storms have made frequent irruptions through the ridge, on which beach-grass grows. On an elevated part of the beach stands the hut, about 1½ miles north of the mouth of Nauset Harbour. Eastham Meeting-house lies from it W.S.W., distant 1¾ miles. The Meeting-house is without a steeple; but it may be distinguished from the dwelling-houses near it by its situation, which is between two small groves of locusts, one on the south and one on the north, that on the south being three times as long as the other. About 1¼ mile from the hut, W. by N., appear the top and arms of a windmill.

The southern part of Nauset Beach, most commonly called Chatham Beach, and by a few persons Potanumaqunt Beach, begins at the mouth of Nauset Harbour, and extends 8 or 9 miles south to the mouth of Chatham Harbour. It is about 50 rods wide. A regular well-formed ridge, which, in the most elevated part of it, is 40 feet high, runs the whole length of it; and, with the exception of a few spots, is covered with beach-grass. This beach forms the barrier of Chatham Harbour, which, from Strong Island, north, receives the name of Pleasant Bay. A mile south of the entrance of Nauset Harbour it joins the main land of Orleans, except in very high tides, when the sea flows from the north-eastern arm of Pleasant Bay into the Harbour of Nauset, completely insulating the beach. By those who are acquainted with the shallow, it may be safely forded at any time; but strangers must not venture to pass it when covered with water, as below the channel is 7 feet deep. On this beach, about half-way between the entrances of Nauset and Chatham Harbours, the trustees have erected a fourth hut. The spot selected is a narrow part of the beach. On the west, the water adjoining it is called Bass Hole. Salt-marsh is north and south of it next the beach, but is here interrupted. Orleans Meeting-house lies from it N.W. The Meeting-house is without a steeple, and is not seen; but it is very near a windmill placed on an elevated ground, a conspicuous object to seamen coming on the coast. It may be necessary to add, that there are three windmills in Orleans, forming a semicircle; that the mill referred to is on the right hand, or N.E. point; and that the mill in the middle point of the semicircle stands on still higher ground. The Meeting-house of Chatham is situated from it S.W. This Meeting-house is also without a steeple, and is concealed by Great Hill, a noted landmark. The hill appears with two summits, which are a quarter of a mile apart. The hut lies east from Sampson's Island, in Pleasant Bay.

Lest seamen should miss this hut, by striking to leeward of it, the trustees have erected another on the same beach. It stands a mile north of the mouth of Chatham Harbour, east of the meeting-house, and opposite the town.

Another spot on the same beach would be a proper situation for a hut. It is north of the fourth hut, and east of the middle of Pochet Island. The highest part of the ridge is near it, south. A break in the ridge, over which the sea appears sometimes to have flowed, divides this high part from the northern portion of the beach.

On the beach of Cape Malabar, or the sandy point of Chatham, the trustees have built a sixth hut. This beach stretches from Chatham 10 miles into the sea towards Nantucket; and is from a quarter to three-quarters of a mile in breadth. It is continually gaining south; above three miles have been added to it during the past 50 years. On the east side of the beach is a curve in the shore, called Stewart's Bend, where vessels may anchor with safety in 3 or 4 fathoms of water, when the wind blows from N. to S.W. North of the bend are several bars and shoals. A little below the middle of the beach on the west side, is Wreck Cove, which is navigable for boats only. The hut stands 200 yards from the ocean, S.E. from the entrance of Wreck Cove, half a mile. Between the mouth of the cove and hut is Stewart's Knoll, an elevated part of the beach. The distance of the hut from the commencement of the beach is 6 miles, and from its termination 4 miles. Great Hill, in Chatham, bears N. by W., distant 6 miles; and the south end of Morris' Island, which is on the west side of the beach, N. by E., distant 4 miles.

Two miles below the sixth hut is a fishing hut, built of thatch, in the form of a wigwam. It stands on the west side of the beach, a quarter of a mile from the ocean. Annually, in September, it is renewed, and generally remains in tolerable preservation during the winter.

Another spot, a few rods from the sea, 4 miles south from the commencement of the beach, and half a mile north of the head of Wreck Cove, would be a proper situation

for a hut. A little south of this spot, in storms and very high tides, the sea breaks over from the ocean into Wreck Cove.

Cape Malabar Beach may be distinguished from the two beaches before described, not only by its greater breadth, but also by its being of a lest regular form. It is not so well covered with grass as Chatham Beach. From Stewart's Knoll south to the extremity, it is lowest in the middle. In this valley, and in other low places, fresh water may be obtained by digging 2 feet into the sand. The same thing is true of Nauset and Chatham Beaches.

The six huts, the situations of which have thus been pointed out, are all of one size and shape. Each hut stands on piles, is 8 feet long, 8 feet wide, and 7 feet high; a sliding door is on the south, a sliding shutter on the west, and a pole, rising 15 feet above the top of the building, on the east. Within, it is supplied either with straw or hay, and is farther provided with a bench.

The whole of the coast, from Cape Cod to Cape Malabar, is sandy and free from rocks. Along the shore, at the distance of half a mile, is a bar, which is called the Outer Bar, because there are smaller bars within it, perpetually varying. This outer bar is separated into many parts by guzzles, or small channels. It extends to Chatham; and, as it proceeds southward, gradually approaches the shore, and becomes more shallow. Its general depth at high water is 2 fathoms, and 3 fathoms over the guzzles; and its least distance from the shore is about a furlong. Off the mouth of Chatham Harbour there are bars which reach three-quarters of a mile; and off the entrance of Nauset Harbour the bars extend half a mile. Large heavy ships strike on the outer bar, even at high water, and their fragments only reach the shore. But smaller ships pass over it at full sea; and when they touch at low water, they beat over it, as the tide rises, and soon come to the land. If a vessel is cast away at low water, it ought to be left with as much expedition as possible; because the fury of the waves is then checked, in some measure, by the bar; and because the vessel is generally broken to pieces with the rising flood. But seamen, shipwrecked at full sea, ought to remain on board till near low water, for the vessel does not then break to pieces; and by attempting to reach the land before the tide ebbs away, they are in great danger of being drowned. On this subject there is one opinion only among judicious mariners. It may be necessary, however, to remind them of a truth, of which we have full conviction, but which, amidst the agitation and terror of a storm, they too frequently forget."*

CHATHAM HARBOUR, on the south-east part of the peninsula of Barnstaple, is a convenient station for the fishery. It has but 18 feet of water at low tide; and the bar is continually shifting. The vicinity has been remarkable for shipwrecks, but the approach is now much improved by two lighthouses on the west side of the harbour,

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* LIFE-BOATS, &c.—At Cape Cod and the surrounding neighbourhood a number of life-boats have been established, and in conformity with a resolution passed at a meeting of the Massachusetts Humane Society, at Boston, on the 13th of April, 1849,—Notices of the locations of the boats and rockets were printed and extensively distributed amongst the shipping. Following is a copy of the Notice, which cannot but prove interesting to our readers:—

"The undersigned give notice that the old boats of the Society are stationed as follows:—

		Life dresses for the crew.
Edgartown, Martha's Vineyard	1 boat	5
Nantucket, near Tuckernuck	1 „	5
Chatham, near the Lights	1 „	8
Nauset Beach, Eastham	1 „	5
Between Highland Light, Cape Cod, and Race Point	3 „	15
Plymouth, north of the town	1 „	5
Scituate, inside the harbour	1 „	5
Cohasset, ditto	1 „	5
Nantasket Beach and Hull	2 „	8
Lynn, near Swamscut	1 „	5
Marblehead Harbour	1 „	5
Gloucester Harbour	1 „	5
Rockport, formerly Sandy Bay	1 „	5
Annisquam	1 „	5
Plum Island, under the care of, and belonging to, the Merrimac Humane Society	1 „	10

There have been located very recently eighteen other boats, named No. 1, twenty-four feet long: No. 2, twenty and twenty-one feet long; No. 3, fifteen and sixteen feet long—which are fitted after

40 feet high, which exhibit fixed lights at 70 feet above the sea, visible 14 miles. It is said that since their erection the beach has somewhat extended.*

On Cape Malabar the south point of Monomoy Island, at 3 leagues southward of Chatham Lights, there is a fixed light at 33 feet above the sea, visible 12 miles. Monomoy Island was a few years since separated from the main land by an irruption of the sea through the sand beach.

NANTUCKET ISLAND is about 15 miles in extent from east to west, and 5 miles broad in its widest part, which is at its south-east extremity, the northern and western parts tapering to points. This island may be recognised by its lighthouses and windmills, which, it is said, can be seen at a considerable distance. The north-west side of the island forms a fine road for ships, which from the eastward, and under

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the plan of Colonel Stanton, with India Rubber canvas floats, made by the Union Rubber Company—the depôt of which is No. 19, Nassau Street, New York.

They are located at	Life dresses for the crews.	
Nahant, No. 1	1 boat	8
Cut River, Marshfield, No. 1	1 „	9
Point Alderton, No. 2	1 „	—
Cohasset, No. 2	1 „	—
Scituate Neck, south of Minot's, No. 2	1 „	—
Chatham, near the lights, No. 2	1 „	—
Monomoy Point, near the light, No. 2	1 „	5
Cuttyhunk, near the light, No. 2	1 „	8
Gay Head, near the light, No. 2	1 „	5
Plymouth, south of the town, No. 2	1 „	—
Deer Island, Boston Harbour, No. 3	1 „	5
Boston Light, No. 3	1 „	5
Swamscut, Lynn, No. 3	1 „	—
Ipswich, near the light, No. 3	1 „	5
Marblehead Neck, No. 3	1 „	—
Scituate Harbour, No. 3	1 „	—
Cuttyhunk, near the other Boat, No. 3	1 „	—
Duxbury, at Powder Point, No. 3	1 „	5

Rockets for throwing a line to wrecks, so as to establish a communication whereby a boat may be more safely hauled through the surf, are stationed at Boston Light—at Point Alderton—Scituate Neck, south of Minot's Ledge—Ipswich Light, Highland Light, Cape Cod—and at Chatham.

Three other boats are being built, under an appropriation from the State, for Plum Island—one to be under the care of the Merrimac Humane Society; one at Race Point, Cape Cod, and one at Wellfleet, near to Newcomb's Hollow, for the Massachusett's Humane Society. Life preservers for all the crews are to be furnished from the same appropriation, so as to insure safety, when boarding wrecks, from the exposed beaches.

The undersigned applied to the Secretary of the Treasury to give orders to the Revenue cutters to protect the property of the Humane Society, and to afford facilities for inspecting the boats and houses on the coasts, and to make experiments, &c. In answer the Secretary writes:—

"In so far as the aid of the Revenue vessels, when employed in the duties specially assigned to them by the ninety-ninth section of the Act of March second, 1799, may be useful in promoting the objects of the Society, the department cheerfully assents to your requests. Of this the Collectors at Boston and Newport have been informed."

The Committee earnestly recommend those who may be cast on the exposed beaches, not to attempt to leave the ship until low water—as many lives have been sacrificed by too hastily attempting to land on a rising tide.

R. D. Forbes,
David Sears,
Samuel Austin,
Committee Mass. Humane Society.

Boston, April 24, 1849.

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* Chatham Harbour suffered much by a storm in May, 1851, which formed a new entrance and washed away part of the beach. We extract the following from the *New York Courier* of June 19, 1851:—"The new entrance into Chatham Harbour was sounded last week. In the south channel the shoalest place found had 9 feet of water upon it at low tide, and the water is constantly growing deeper. In the part of the channel where the beach was, the sand is washed entirely away, and there are 16 feet at low water, and muddy bottom. At first, there were two passages through, with a narrow strip of beach between. This strip is now nearly all washed away, and is covered at half-tide. The north channel has less water than the south, but there is sufficient depth at high water for fishermen and vessels not drawing more than 10 feet. The tide continues to be very rapid, running, in the strength of the tide, 6 knots. Four men cannot row a boat against it. The old entrance has become so shallow that a boat cannot pass out at low water. By this change Chatham Lights have become useless as a direction for entering the harbour."

favourable circumstances, may be readily attained; but a north-west wind causes a heavy swell.

On *Great Point*, the north point of Nantucket Island, is a lighthouse, 60 feet high, which shows a fixed light at 70 feet above the sea, visible 13 to 20 miles.

On *Sankaty Head*, the south-east point of the island, there is a lighthouse 65 feet high, painted in rings alternately white and red, which shows a fixed and flashing light at 150 feet above the sea, visible about 20 miles. The flash is once in a minute and of 10″ duration.*

NANTUCKET SHOALS.—These extremely dangerous shoals lie within a radius of 20 miles from the coast of Nantucket; and as they are generally steep and there are no landmarks sufficiently distinguishable to enable a stranger to avoid them, it is considered more prudent to keep outside them altogether than attempt to save a little distance by venturing inside. Even local knowledge is sometimes at fault in consequence of the difficulty of recognising the objects on shore on account of the distance; large vessels, therefore, seldom approach within the New South Shoal, the most southern danger, without having an experienced pilot on board, and then only with great care and considerable anxiety to those in charge. Most of the shoals have their positions indicated by the ripples which the current makes at all stages, excepting, of course, at slack tide: they may also generally be perceived by a discoloration of the water.

New South, or Davis's South, Shoal.—This, the outermost of the Nantucket Shoals, lies about 20 miles south-eastward of Sankaty Light, and is exceedingly dangerous, as close outside it is deep water. It has lately been surveyed by Commander Davis, of the United States Coast Survey, who has made the following remarks upon it:—"The New South Shoal has on it only 8 feet in some places, and bears from the centre of the Old South Shoal from S. 3° 28′ W., to S. 16° 42′ E., by compass, being distant 6⅔ miles. It is 2$\frac{3}{10}$ miles in length from east to west, and its greatest breadth from north to south is nine-tenths of a mile.

Between it and the Old South Shoal there are soundings of from 4 to 18 fathoms, but north and east of it are ridges of only 20 to 24 feet to the extent of about three miles from the New Shoals. Deep water separates these ridges, and the soundings on them are very irregular.

The tide-rips showed that two, and perhaps three, lines of shoal water are near each other, in parallel directions. The latitude of the centre of the New Shoals is 40° 57′ 50″ N., long. 69° 51′ 40″ W., and it bears from the lighthouse on Sankaty Head, S. ¼ E., 19⅓ miles.

The tides set regularly round the compass, the main body of the flood running eastward and the ebb westward, varying north and south of East and West; but the flood begins to turn southward, passing round to the West, and ebb northward, passing round to the East, about 1½ hour before the principal set and strength are attained.

Upon the shoals the tides run across their line of direction, and are much more rapid, which makes an approach on the side to which the tide is setting very dangerous. The tide is never still; at even slack water its velocity is seldom less than half a mile, and on the second quarter of the flood and ebb it sets at a rate of two knots."

From the New South Shoal a ridge of 5½ to 9 fathoms extends 5 miles in a N.N.E. direction, and has immediately on its edge from 10 to 12 fathoms, deepening very rapidly to 20 and 25 fathoms. On it the sea breaks in bad weather. From the centre of this ridge, the centre of the New South Shoal bears W. by S., 4 miles, and the middle of the Old South Shoal, N. ¾ W., 6 miles.

No part of Nantucket Island is visible from the New South Shoal; but the revolving light on Sankaty Head is distinctly visible when the weather is clear, and is a valuable mark to indicate its position.

The lightvessel stationed at about 2 miles† southward of the shoal is moored in 14 fathoms, and shows two fixed lights at 44 feet above the sea, visible 12 miles. It is

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* This building originally showed a *flashing red* light every minute, to the distance of 7 miles, as a warning to keep clear of the dangers off the coast, a *fixed red* light being visible between the flashes. It is possible that since the establishment of the lightvessel at the New South Shoal this distinction may have been discontinued.

† We have been informed that the vessel is at less than a mile from the shoal, and that it must always be passed on the south side.

schooner-rigged, coloured red, and has the name "Nantucket South Shoal" on both sides. A fog bell and horn are provided for use in thick weather, and a gun is fired at intervals.

Old South Shoal.—This shoal lies northward of the New South Shoal, about 6⅓ miles, and has soundings between of 11 to 12 and 17 fathoms, on an irregular bottom. It is situate in lat. 41° 5′, and long. 69° 51′, and its centre bears S. by E. 12⅓ miles from the lighthouse on Sankaty Head. It is about 2 miles in extent from N.E. by N. to S.W. by S., and about half a mile broad. The bottom consists of hard white sand, and the sea breaks over it in a tremendous manner, so that, at all times, it must be cautiously avoided, particularly as on some parts there are not more than 3 to 8 feet water, with 12 fathoms close-to.

The ground northward and north-eastward of the Old South Shoal is broken, dangerous, and marked by occasional strong tide-rips. It is probable that there are not any dangers westward of it, as none were found in the examination that was made of the locality. The soundings now become more regular, and it is said that at 20 miles westward of the shoal the depths are 25 to 30 fathoms on black shining mud.

At about 4¼ miles N. ¼ W. from the eastern end of the Old South Shoal, there is a small patch of 8 feet water having a depth of 6 fathoms close to it, which lies S.S.E. ⅓ E. 9 miles from Sankaty Lighthouse; and 2 miles north-eastward of this, are two patches of 14 and 15 feet, lying 7½ to 9 miles S.E. ⅓ S. from the same building. There are also some shoals of 8 to 14 feet between these patches and the Bass Rip, but lying rather nearer to the latter, at the distance of 4 miles S.E. from the village of Siasconset. As there may be other shoals yet undiscovered, it will be prudent when sailing among them to keep a good look-out.

Small coasting vessels from the northward steering along the shore of Nantucket, and taking the outside way, are advised to follow the east side of Bass Rip, and, passing over the tail of it in 4 fathoms, to haul round under the south side of the Old Man, which, being generally visible, it is best to keep in sight. Here there is a good beating channel, of, at least, two miles in width;—*i.e.*, from ½ a mile to 2½ miles from the Old Man. Vessels making this course with an ebb (or westerly) tide, will clear the shoals in a few hours. They will also have more room, and be more favoured by the prevailing westerly winds, than in Nantucket Sound.

Pochick Rip.—This is a rip immediately off the south-east part of Nantucket Island. It commences at a short distance from Siasconset Village, and runs E.S.E. about one mile, when there is a patch of only 6 feet at low water, between which patch and the island there are a few swatches of from 2½ to 3 fathoms, and therefore deep enough for small vessels to pass. From the patch the Rip runs South 1½ miles, when there is another swatch, half a mile wide, and 7 fathoms deep. There is a very shoal spot of 6 feet at ¼ of a mile W.S.W. from this channel; which shoal spot runs S.W. by W., one-quarter of a mile, and is succeeded by a swatch 40 rods wide, from which Tom Never's Head bears N.N.W., distant 3 miles. You then come to the east end of the Old Man.

Old Man.—This shoal runs in a W.S.W. direction about 4 miles, and has from 8 feet to 3 fathoms upon it. In about the centre of the shoal there is a narrow passage of 3¼ to 4 fathoms, through which boats may pass into the anchorage between the shoal and Tom Never's Head. On either side of this shoal are 7 to 8 and 12 fathoms. The east end of this shoal bears S. ⅓ E. from the lighthouse on Sankaty Head, distant 3 miles, and its west end S.W. ¼ S. from Tom Never's Head, distant 4⅓ miles.

The space between the Old Man and Pochick Rip and the shore contains excellent anchorage, which with the wind at N.W., N.N.E., E.S.E., South, or S.S.W., is considered to be better than any in Vineyard Sound to vessels bound northward or eastward, particularly in the winter season, provided the cables and anchors are good. The depth is 5 fathoms, coarse sand, with Tom Never's Head bearing E.N.E. ½ N., and the southernmost land W. by N.; from this to the Old Man the soundings are 5 to 14 fathoms, red sand, which will be about half-way between the two, and from this the depth decreases from 13 to 3 fathoms, fine sand, with black specks.

Bass Rip.—This shoal lies about 2⅓ miles eastward of Siasconset Village, and is about 2½ miles long in a N. by E. and S. by W. direction, and has from 8 to 10 feet water upon it, and in some places less. Close-to all round it are 5 to 7½ fathoms. Southward of the shoal there are various patches, of 8 to 14 feet, scattered about. The north end of Bass Rip bears E. by S. from the lighthouse on Sankaty Head, distant 3 miles; and its south end S. by E. ¾ E. from the same object, distant 4¾ miles.

New Shoal.—This is a small patch lying about two miles eastward of the Bass Rip, upon which there are only 10 to 14 feet water, and 7½ fathoms close-to. From it Sankaty Head bears W.N.W. ¾ W., distant 4½ miles, and Great Point Light, N.W. ¼ N., 10¾ miles.

Northward of the Bass Rip and New Shoal, about 4 miles, there are several patches of 10 to 14 feet water, situate about 3½ miles from the shore, close to which is a depth of 4½ fathoms. From the northernmost of these shoals Sankaty Head bears S.S.W. ½ W., distant 4½ miles, and Great Point Light N.W. by W. ¼ W., 5¾ miles.

M'Blair's Shoals.—These are a cluster of 9 to 18 feet patches, lying in lat. 41° 24′ N., and long. 69° 49′ W. They have immediately around them 8 to 9 fathoms, and must be cautiously avoided by all vessels approaching Nantucket Island from the north-eastward. From their centre Great Point Light bears W. ¾ N., distant 10¼ miles, and Sankaty Head S.W. ¾ W., nearly 10 miles.

These shoals can readily be perceived by the ripples upon them, caused by the tide, excepting during slack water, at which time there is, of course, no ripple; but in daylight they exhibit the usual discoloration of water.

Great Rip.—This is a narrow shoal lying about 10 miles to the eastward of Sankaty Head. Its northern extremity is about 4 miles to the southward of the M'Blair Shoals, in lat. 41° 21′ and long. 69° 45′, from whence it extends 13 miles to the S. ¼ E. to lat. 41° 8′ and long. 69° 42′ 30″. The soundings over it average 3½ to 5 fathoms, but there is a part near its northern end where for a space of 4 miles there is a depth of not more than 10 to 17 feet, in the centre of which is a spot of 7 feet named the Rose and Crown; this spot is in lat. 41° 17′ and long. 69° 43′ 30″. In lat. 41° 15′ a small ship might cross the rip, as here for about a mile is a depth of 5 to 6 fathoms, but this depth is not continued, as it soon decreases in proceeding to the southward to 3½ fathoms, with two shoal spots of 17 feet. At 4½ miles from the southern end the rip has only 4 to 13 feet on it, and there are many shallow spots of 9 to 17 feet between this and the south extremity of the shoal, which might take up a vessel of heavy draught when attempting to cross it either from the eastward or westward. Upon the whole the rip has a very irregular shape, and as there are many shoal spots about it which may have a shifting character, and the soundings in its immediate vicinity are deep, a vessel should always avoid approaching too near.

Davis's Bank.—This bank extends from lat. 41° 0′ and long. 69° 39′, in a N. ½ E. direction 4½ miles, being here very narrow, and having a depth over it of 6 to 8 fathoms; thence it runs to the N.N.E. ¾ E. 5¾ miles, and widens to about ¾ of a mile, but the soundings on it decrease to 5 and 3¾ fathoms. The bank then continues to the N.N.E.-ward, 5 miles, and increases in breadth as well as in depth, the soundings over this part being from 6 to 9 fathoms; it thence runs some distance further northward with a gradually increasing depth until it is finally lost in about lat. 41° 15′ and long. 69° 33′. The bottom in this latter position is very uneven, there being many spots of 9 to 5 fathoms.

Fourteen Feet Shoal.—Among the many shallows northward of Davis's Bank there is a small patch of 14 feet, situate in lat. 41° 17½′ and long. 69° 37½′. It has deep water of 12 and 13 fathoms close to it on each side.

Thirteen Feet Shoal.—This is a little patch 3 miles northward of the Fourteen Feet Shoal, having close around it a depth of 12 fathoms. Its position is lat. 41° 21′ and long. 69° 37′.

Fishing Rip.—At about 10 miles westward from Davis's Bank is situate the Fishing Rip, a series of shallows of less than 10 fathoms, but none are sufficiently near the surface to take up a large vessel. They probably extend from lat. 41° 0′ and long. 69° 27′ to lat. 41° 7½′ and long. 69° 23′, but thence northward are numerous small banks of less than 10 fathoms, so that it is difficult to define their exact limit. Almost close to the eastern side of these shallows are soundings of 22 and 18 fathoms, and the prevailing depth westward of them, or between them and Davis's Bank, is 15 and 16 fathoms.*

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* The Fishing Rip and New South Shoal have hitherto been supposed the outermost of the shoals off the coast of Nantucket, and the latter is doubtless the furthest to seaward of those that are dangerous, but on Aug. 16, 1860, the steamship *Asia* obtained soundings of 11 fathoms, gray sand and yellow specks, in lat. 40° 46′ 30″ and long. 69° 24′ 30″, or about 13 miles S. ½ E. from the south

It has been observed "that about the coast of Nantucket and the Shoals, the bottom is generally sandy, and the tide very rapid. In moderate weather a vessel had better anchor than be driven about. The course of the tides over the shoals is nearly regular. The N.E. tide makes flood. A south moon makes full sea in the harbour of Nantucket. A S.S.E. and N.N.W. moon makes high water on the shoals. The tide of flood sets N.E. by E., and ebb S.W. by W., from 2 to 3 miles in an hour: the rise and fall is from 5 to 6 feet."

NANTUCKET SOUND is the space between Nantucket Island, Martha's Vineyard, and the mainland of Massachusetts. In length it is about 25 miles, in average breadth about 15 miles, and the general depth varies from 6 to 8 fathoms; but the many shoals, for which this neighbourhood is notorious, very much interfere with its navigation, and render it advisable for all strangers to obtain the aid of a pilot, especially as these banks are so precipitous that the approach to them, in some cases, is not detected by the leadsman before the vessel is aground, and being composed of loose sand they are exceedingly liable to change their form, depth, and position, besides which, the irregularities thus produced in the level of the sea-bottom give rise to those remarkable currents so peculiar to this locality, and so frequently disastrous to commerce. On the edges of the sands most in the way of vessels passing through, or to or from any of the ports in the sound, buoys are placed, which are shifted and re-moored as circumstances require.

The principal places in the sound are, Nantucket Harbour, on the north side of Nantucket Island; Edgartown and Holmes' Hole, on the north-east coast of Martha's Vineyard; and Old Stage and Hyannis Harbours on the Massachusetts shore.

There are three entrances to Nantucket Sound, the eastern one between Monomoy and Nantucket Islands, the southern, named Muskeget or Tuckernuck Channel, between Nantucket Island and Martha's Vineyard, and the western between Martha's Vineyard and Elizabeth Islands, named Vineyard Sound.*

LIGHTS.—The two fixed lights on the west side of Chatham Harbour; the fixed light on Cape Malabar, the south point of Monomoy Island, and the northern point of the eastern entrance to Nantucket Sound; the fixed light on Great Point, the north-east extremity of Nantucket Island, and the south point of the said entrance; and the fixed and flashing light on Sankaty Head, the south-east extremity of Nantucket Island; have all been described on pages 99, 100, 101.

Pollock Rip Lightvessel, moored in 6 fathoms, $3\frac{1}{4}$ miles S.E. by E. $\frac{1}{2}$ E. from Monomoy Lighthouse, on the southern side of the shoal, $1\frac{1}{8}$ mile S.E. from its shoalest (7 feet) spot, is coloured red, and exhibits a fixed light at 45 feet from the water, visible 12 miles in clear weather, and in the day-time a red hoop-iron day-mark is hoisted at the mast-head; during foggy weather a bell is rung

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end of the Fishing Rip. It was supposed that this cast was on a rip of $\frac{1}{2}$ a mile in extent from N.N.E. to S.S.W., as only a short time previously the depth was 32 fathoms, and immediately afterwards the lead was again hove in 32 fathoms. This rip (the Asia Rip, as it is called on our chart) was subsequently sought for by Lieut. Phelps, of the United States Coast Surveying Service, who not only examined it, but found another in its vicinity fully $6\frac{1}{2}$ miles long from N.N.E. to S.S.W., and 2 miles broad, upon which was a depth of 10 fathoms. Full particulars of these discoveries are expected to be made public shortly.

* The following regulations relative to the pilotage were in force some years since, and are added, as they may still be in use:—

By the Act for regulating the compensation to pilots, 1820, it was enacted, that any person who shall faithfully and skilfully pilot any vessel through the Vineyard Sound, over Nantucket Shoals, to her port of destination in Boston Bay, or eastward thereof, shall be entitled to receive the following rates of pilotage:—From the 1st of November until the 31st day of March, inclusive, for a vessel not drawing more than 11 feet of water, $3\frac{1}{2}$ dollars per foot; if drawing over 11 and not more than 14 feet, 4 dollars per foot; if drawing over 14 feet, $4\frac{1}{2}$ dollars per foot. From the 1st day of April until the 31st day of October, inclusive, for a vessel not drawing more than 11 feet, $2\frac{1}{2}$ dollars per foot; if drawing over 11 feet, and not more than 14 feet, 3 dollars per foot; if drawing over 14 feet, $3\frac{1}{2}$ dollars per foot; with an addition of 5 dollars if such person shall be landed at any place to the eastward of Cape Anne, and not eastward of Portsmouth; or of 10 dollars if landed eastward of Portsmouth.

The provisions of this Act do not extend to any case where an agreement, in writing, shall be made between the master or owner of a vessel, and the person who may undertake to act as pilot of such vessel, fixing any other rate of pilotage for such services; but nothing in the Act affects any law respecting pilotage previously in force.

and a horn sounded every alternate 5 minutes. A S. by W. course up to, or a N. by E. course for 2 miles from this lightvessel, will, if made good, take a vessel through the slue or swashway, over the shoal, in not less than 3 fathoms; the black buoy distant $\frac{5}{8}$ of a mile N. $\frac{3}{4}$ E. from the lightvessel must be passed close to on its eastern side.

The *Shovelfull Lightvessel* is moored in $5\frac{1}{2}$ fathoms in the southern part of the channel between that shoal and the Handkerchief Bank at $4\frac{1}{8}$ miles W. $\frac{1}{2}$ N. from Pollock Rip lightvessel, and S.W. $\frac{1}{4}$ W. $1\frac{3}{4}$ miles from Monomoy lighthouse. It is painted green, and shows a fixed light 40 feet high, visible 11 miles. A red hoop-iron work at the mast-head serves as a day mark, and in foggy weather a bell is rung and a horn sounded every alternate 5 minutes. By preserving a W. $\frac{1}{2}$ N. course from Pollock Rip lightvessel you will not have less than 4 fathoms up to the Shovelfull, and by passing a red buoy, and leaving the latter lightship close on your port hand, and the opposite black buoy on the south edge of that shoal on the starboard, you may steer N. $\frac{1}{2}$ W. towards Powder Hole or the northern shore of the sound.

Handkerchief Shoal Lightvessel is schooner-rigged, with a black oval grating day-mark at each mast-head, and her hull is painted straw colour, the word "Handkerchief" in large black letters being on each side. It lies in $5\frac{1}{2}$ fathoms, $1\frac{1}{2}$ mile southward of the south part of the shoal, with Monomoy lighthouse N.E. $\frac{1}{4}$ N., and Great Point lighthouse S. $\frac{1}{2}$ W., and shows a fixed light 40 feet above the level of the sea, visible 10 miles.

This and the two former lightvessels serve as excellent guides to vessels entering Nantucket Sound through Butler's Hole, for, by steering West for nearly 3 miles from Pollock Rip lightvessel, or till Monomoy lighthouse bears North, and then shaping a S.W. by W. course towards the Handkerchief lightvessel, which may be passed on either side, they will go clear of the Pollock Rip, Shovelfull, and Handkerchief on the starboard, and of the Broken Rips or Stone Horse Shoal on the port hand, in not less than 17 or 18 feet water. Although the prominent edges of these banks are pointed out by buoys, too much freedom should not be taken with these courses, because, at the turning point, the channel is only one mile in width, and but very indifferent warning is given by the lead of an approach to either side.

Nantucket Harbour, Bass River, and Hyannis Lights are mentioned in the subsequent description of those places.

The *Bishop and Clerks* are a ledge of rocks situated 2 miles southward of Hyannis Harbour, in the northern part of Nantucket Sound; upon the north part of the shoal is a granite tower built on a cylindrical pier 12 feet high, and as the tower has an elevation of 47 feet, the light, which is a revolving one, with a bright flash every half minute, and is shown at the height of 59 feet above the level of the sea, can be seen at the distance of 14 miles. A fog bell is rung by machinery in thick or hazy weather, the interval between the sounds being 15 seconds. Bound to Hyannis a vessel by steering N.W. 9 miles from the Handkerchief lightvessel, will be within 2 miles of this lighthouse, and may then proceed for the harbour as hereafter directed.

Cross Rip Lightvessel is stationed in the middle of Nantucket Sound, in the main channel which lies between the extensive Horse Shoe and Tuckernuck Shoals, in a depth of 8 fathoms. It is of a straw colour, sloop-rigged, has a red hoop-iron day-mark at the mast-head, and, during night, exhibits a fixed light at the height of 39 feet, visible about 7 miles. During foggy weather a bell and horn are sounded every alternate 5 minutes. About $\frac{1}{3}$ of a mile south-westward of the lightvessel is the buoy marking the edge of the Cross Rip; the usual passage is between these. From Handkerchief lightvessel to Cross Rip lightvessel the course is first W. $\frac{1}{2}$ S. 8 miles, and then W. by N. $\frac{1}{2}$ N. nearly 3 miles.

Cape Poge Lighthouse consists of a whitewashed wooden tower, with a black lantern, and stands on the north-east extremity of Martha's Vineyard, on the point forming the eastern side of entrance to Edgartown Harbour. The light is fixed, elevated 55 feet above the sea, and visible to the distance of 13 miles in clear weather. A shoal runs off northward from the base of the lighthouse a distance of $\frac{3}{4}$ of a mile, the edge of which is marked by a buoy.

Edgartown light is mentioned in the description of that place.

Succonesset Lightvessel is moored in 6 fathoms, in what is called the North Channel of Nantucket Sound, near the south-west end of Wreck Shoal, and nearly

midway between Succonesset and Eldridge Shoals, and 7 miles N. by E. ½ E. from Cape Poge. It is painted in alternate squares of red and cream colour, is schooner-rigged, with two red hoop-iron day-marks, and during night exhibits one fixed light, 40 feet high, visible 10 miles. A fog-bell and horn are sounded in foggy weather every alternate 5 minutes. Entering from Vineyard Sound and sailing on the northern side of L'Homme de Dieu Shoal, when the lightvessel is distant about 4 miles ahead, bring it to bear E. ¾ S. and steer for it, passing the buoy on the north end of Loose Shoal on your starboard hand. Leaving Hyannis for the westward, steer for and keep it bearing W. by S. ½ S.

West Chop lighthouse, erected on the north extreme of Martha's Vineyard, and on the west point of entrance to Holmes' Hole, is coloured white, 33 feet high, and shows a fixed light at an elevation of 60 feet above the mean sea level, visible at a distance of 12 miles. A W. by N. ½ N. course 10 miles from the Cross Rip lightvessel will lead towards it in from 8 to 10 fathoms; give the Squash Meadow buoys, and East Chop, and this lighthouse, a berth of ¾ of a mile on the port hand to avoid the offlay from them.

TIDES.—In *Butler's Hole*, the northern channel of the eastern entrance to Nantucket Sound, it is high water on the days of full and change of the moon at 11¾ h.; springs range 5¼ and neaps 2½ feet. The flood runs westward and south-westward upon the average about 1½ mile per hour, attaining its greatest strength during the second quarter; and the ebb sets eastward and north-eastward, with but a slightly decreased velocity. The duration of each stream is also nearly equal—namely, the western stream 6h. 10m., and the eastern 5h. 50m.

In the *Main Channel* of the eastern entrance, off Great Point, the flood runs westward, and the ebb between eastward and north-eastward, the former at the rate of from 1¼ to 1¾ miles, and the latter with a velocity of about 1½ mile an hour. High water takes place at 12h. 6m.; springs range 4½ and neaps 2½ feet; the duration of the westerly stream is about 5h. 40m., and of the easterly 6h. 20m.

At the *Cross Rip* lightship the flood sets nearly W.N.W. about ¾ of a mile per hour, and the ebb easterly above a mile in the same period. The flood stream has a duration upon the average of 5h. 54m., and the ebb of about 6h.

Off *West Chop* lighthouse it is high water at 11¾h.; springs range 1¾ and neaps 1¼ feet. Generally speaking, both streams in the fairway follow the direction of the channels, continuing for about 6 hours each way, but as they have a tendency towards the shoals, particularly in their immediate vicinity, caution should be taken to guard against their influence.

Near the *Bishop and Clerks* lighthouse high water takes place at 12h. 20m. on full and change days; springs range 3¾ feet, and neaps 1¾. The westerly or ebb stream continues for 5h. 50m., running about ¾ of a mile an hour, and the flood or easterly stream for 6h. 10m., having a similar velocity.

Muskeget Channel.—At Wasque Bluff it is high water at 9h. 12m.; springs range 2½ feet, and neaps 1⅙. The velocity of both streams is very great, amounting upon an average to between 3½ and 4 miles an hour. This is owing, it is said, to the circumstance, that there exists at certain stages of the tides a large difference of level between the waters of the sound and those of the open sea to the southward. Hence there is a rush of water through Muskeget Channel in order to restore an equality.

DIRECTIONS.—*If intending to enter Nantucket Sound through Butler's Hole*, coming from the eastward, and when about 2 miles East of Chatham lights, bring Pollock Rip lightvessel to bear S. by W. ½ W. and steer for it, leaving the black buoy on Pollock Rip on the starboard hand. When up with the lightship, steer West till Monomoy lighthouse bears North; in this course your sounding will not be less than 17 or 18 feet, these depths being found when passing over the northern prolongation of the Broken Rips or Stone Horse Shoal, the extremity of which is marked by a red buoy, which you will leave a little on the starboard hand. Steer now S.W. by W. for the Handkerchief lightvessel, leaving another red buoy about ¾ of a mile distant on your port side. To ensure a greater depth of water, when up with Pollock Rip lightvessel, steer W. by N. for 2½ miles, or till Monomoy lighthouse bears N.N.W.,* then pro-

* A buoy with black and white perpendicular stripes is, we believe, moored hereabout in 28 feet water, with Shovelfull lightship W. ¼ S., and Pollock Rip lightship E. by S.

ceed on a S.W. ½ W. bearing for the Handkerchief lightship; on these latter courses you will leave both the foregoing red buoys on the port hand. Although the prominent parts of the Pollock, Shovelfull, and Handkerchief Shoals, which form the northern side of Butler's Hole, are marked by black buoys, and those of the Broken Rip or Stone Horse, forming the southern side, by red ones, yet too great a freedom should not be taken with these directions in tacking towards either side of the channel, because the lead gives but a very indifferent warning of an approach to the shoals.

From Handkerchief lightvessel to Cross Rip lightvessel the course is first W. ½ S. 8 miles, and then W. by N. ½ N. nearly 3 miles, passing the latter vessel on its southern side, between it and the red buoy on the north end of Cross Rip; here the channel is but 300 fathoms in width.

To enter Nantucket Sound by the Main Ship Channel, keep at the distance of about 4 miles from off Chatham lights, and bring them to bear W.N.W., then steer South for 13 miles, passing 7 miles eastward of Monomoy lighthouse, 4 miles eastward of Pollock Rip lightship, and 2½ miles eastward of the buoy on the outer end of the broken part of Pollock Rip. If this course be made good, then Sankaty Head light will be seen (in clear weather) bearing S.W. ¼ W., and if Great Point light be not brought northward of West you will clear the M'Blair Shoals. Therefore, as soon as Sankaty light bears S.W. ¼ W. distant about 12 miles, haul up W. by N., steering in between M'Blair Shoals on the southern and the Great Round Shoals on the northern side, passing the red buoy on the extremity of Great Point Rip, a shoal extending 3¼ miles E.N.E. from Great Point lighthouse, and also the red buoy on the north-east end of the Tuckernuck Shoal, on the port hand; and the black buoy on the Great Round Shoals on the starboard, giving it a berth of not less than 1 or 1¼ mile. If this course (W. by N.) be followed, when abreast the Tuckernuck buoy, Cross Rip lightvessel will be seen bearing about W.N.W.; steer for it, and leave it almost close-to on your starboard hand, as before directed.

From the Cross Rip lightship steer W. by N. ½ N. 10 miles, which will bring you up to between the red buoys on the east and west extremities of Squash Meadow, and the striped buoy on the east end of the Hedge Fence Shoal. Shape a course now for Nobska Point light, steering N.W. by W., and give the Squash Meadow buoys, the East Chop, and the West Chop lighthouse a berth at least of ½ a mile on your port hand. This offing, however, should not be increased to more than 1 or 1¼ mile for fear of running on the Hedge Fence, which is long, narrow, and steep-to, with only 4 or 5 feet on its shoalest part; its extreme points are distinguished by striped buoys. When about one mile S.E. by E. from Nobska light, follow the directions hereafter given for Vineyard Sound.

Bound through the North Channel of Nantucket Sound.—Follow the directions already given (page 106) up to Pollock Rip lightvessel. From the lightship steer W. ½ N. up to Shovelfull lightvessel, passing the red buoy on the north extreme of the Stone Horse or Broken Rip, close on the port hand, and the black buoy on the south end of the Shovelfull on the starboard. From Shovelfull lightvessel haul up to the N. ½ W. and continue so till Monomoy lighthouse bears East, remembering only that the edges of the Shovelfull and Handkerchief Banks, which form the east and west boundaries of this channel, are but 3½ cables' lengths apart, and that in tacking towards them by the lead you will suddenly shoalen your water from 5 and 4 fathoms to 10 and 6 feet, or even less. When Monomoy light bears East, a N.W. by W. course will clear the north end of the Handkerchief, the red buoy on the edge of which must be left to port; by following this direction for 6 miles, Bass River light will be seen bearing North distant 3½ miles.

Or, the N. ½ W. course from Shovelfull lightvessel may be continued* till Monomoy lighthouse bears S.E. ¾ E.;† then steer N.W. ½ W. for about 2 miles, leaving the buoys on the shoal to the northward on the starboard side, and afterwards W. by N. up to where Bass River light bears North distant 3½ miles. Proceed then on a W. ½ N. course, leaving the buoys on the Senator Shoal and Gazelle Rock, which extend southward from Point Gammon, the eastern side of entrance to Hyannis, on the northern side, and the Bishop and Clerks' lighthouse between ½ and ¾ of a mile to the south-

* But it will lead very near to a 12-feet spot lying W. by N. from the lighthouse, and ⅛ of a mile off shore.

† With this bearing of the lighthouse, and Shovelfull lightvessel S. ½ E., a black and white striped buoy is said to be moored, which will serve as a guide for the turning point in this channel.

ward of you. When this latter lighthouse bears E. by S. ½ S., and the Bug light at Hyannis N.E. by N. ½ N., at which time the eastern or New Spire at Hyannis will be on, or nearly so, with the middle of the breakwater, put the vessel's head W. by S. ½ S., which will carry you between the red buoys on the Middle Ground, the north end of the Horse Shoe, and the Eldridge Shoals, on the port hand, and the black ones on the W.S.W. Ledge and Wreck Shoal, on the starboard side, up to Succonesset lightvessel. You will know when you are off the northern end of the Horse Shoe by your water deepening to 9, 10, and 11 fathoms. In turning to windward hereabout do not approach the Horse Shoe nearer than into a depth of 10 fathoms, nor the shore than into 3½ fathoms. Pass close round the south side of this lightship and steer W. ½ N., leaving the buoys on the Succonesset Shoal to the northward, and those on Loose Shoal and L'Homme de Dieu* to the southward, and as soon as Nobska light bears West steer for it, giving the buoy on the west end of L'Homme de Dieu Shoal a berth of 500 yards on the port hand, and Nobska Point a berth of ¾ of a mile on the starboard. Hence through Vineyard Sound, see directions subsequently given for that Channel.

For vessels sailing from Vineyard Sound through Nantucket Sound to the eastward, there will be no difficulty in reversing the foregoing directions. It should, however, be borne in mind that they are only intended as a guide, when strangers cannot obtain the assistance of local knowledge, which they are recommended to do if at all possible. The same also may be said of the instructions for Muskeget Channel, which follow.

Muskeget or Tuckernuck Channel, the passage into Nantucket Sound from the southward, between Nantucket Island and Martha's Vineyard, is mainly occupied by extensive shoals, so much so that the principal navigable passage, which runs along the western side, and parallel to the eastern shore of Martha's Vineyard, is but 3½ cables wide in its southern part. This passage should not be attempted at night, and at all times careful attention should be paid to the lead and the set of the currents. Intending to leave Nantucket Sound by this channel, and having followed the directions already given till abreast of Cape Poge lighthouse, steer so as to pass about a mile northward and eastward of it, bringing it in range with Edgartown spire, then shape a course S. ½ W., steering parallel to and at the distance of a mile from the shore, leaving the red buoy on the south-west end of Hawes' Shoal on the port, and the black buoy on Tom Shoal on the starboard hand. Continue this course for 6 miles, when you will find the water suddenly deepen to about 17 fathoms, and the red buoy on Mutton Shoal ahead of you, distant ½ a mile, with the church on Sampson's Hill, at the same time bearing N.W. ¾ N. Steer from this position S.W. ½ S. to pass between Skiffs Island and Mutton Shoal, leaving the red buoy on the latter on the port hand. Keep this course one mile, when Wasque Bluff, the south-east end of Martha's Vineyard, will bear N. by W., and then you may follow any direction between South and S.S.W., and pass out clear of all danger.

NANTUCKET HARBOUR lies on the north side of Nantucket Island, is about ½ a mile in extent, has a depth of from 7 to 15 feet at low water, and affords good anchorage in 14 feet abreast the wharves, with from 7 to 11 feet alongside them, but the entrance has as little as 4 and 4½ feet over the bars, though with a careful attention in steering from buoy to buoy, not less than 6 or 6½ feet may be maintained up to the anchoring place. It is high water on the days of full and change at 12h. 24m.

Rise of highest tide above the plane of reference...	4.9	feet.
Height of mean high water above do.	3.2	„
Fall of lowest tide observed below do.	1.8	„
Fall of mean low water of spring tides below do...	0.3	„
Mean rise and fall of spring tides.....	3.6	„
Mean rise and fall of neap tides	2.5	„
Mean duration of rise	6h.	23m.
Mean duration of fall.....	5h.	44m.
Mean duration of stand.....	0h.	9m.

On Brant Point, which forms the west side of the harbour's mouth, there is a red-coloured tower 42 feet high, showing a fixed light at the height of 46 feet above the level of the sea, visible 11 miles; this tower in range with the beacon on the south

* The Homme de Dieu Shoal should not be approached nearer than into 7 fathoms water, as it is bold-to and has but 4 feet upon it.

side of the harbour will clear the Black Flat on the west side of the channel. A small fixed light, named Old Bug, is exhibited from the window of a little wooden house on the south-east side of the harbour. Nantucket Cliff beacon lights, situated on the beach $\frac{5}{8}$ of a mile N.W. by W. $\frac{1}{4}$ W. from Brant Point lighthouse, are both fixed,* and visible about 4 miles off; they are 300 feet apart in a N.E. and S.W. direction.

Having entered Nantucket Sound by Butler's Hole, as already directed, page 106, and when up with the Handkerchief lightvessel, steer S.S.W. towards the harbour, leaving Great Point light 1 or $1\frac{1}{2}$ mile distant on the port hand. Entering by the Main Ship Channel, proceed as before directed till Great Point light comes to the eastward of South, then follow a S.S.W. course. Or, if from the westward, from Cross Rip lightship steer E.S.E., and as soon as Great Point lighthouse bears S.E. $\frac{1}{2}$ E., distant about 5 miles, haul up S. $\frac{1}{2}$ E. for the harbour's entrance, leaving the red buoy on the north-east extremity of Tuckernuck Shoal $1\frac{1}{2}$ mile westward of you.

Commander Davis, U.S.N., who surveyed the harbour in 1846, gives the following instructions for entering; but as the bars are liable to shift, we recommend strangers to employ a pilot.

"A vessel that is to be carried over the bars on the camel will, after passing Great Point Light, or Tuckernuck Shoal, run for the town on a S.S.W. or S.S.E. course, and anchor in from 5 to 6 fathoms water, with Brant Light bearing S. by E. or S. $\frac{1}{2}$ E.

A vessel of small draught that can pass the channel, will run for the buoy-boat off Nantucket Cliff, which is distinguishable by its mast, and anchor near it in 3 or 4 fathoms water, the square tower of a church showing through a gap in the cliff.

The *Western* or *Best Channel* is marked by buoys in the following order:—

From Buoy-boat	Steer for Buoy	No. 1 or Outer Bar Buoy.
„ Outer Bar Buoy	„	No. 2 or Inner Bar Buoy.
„ Inner Bar Buoy	„	No. 3 or First Flat Buoy.
„ First Flat Buoy	„	No. 4 or Second Flat Buoy.
„ Second Flat Buoy	„	No. 5 or Third Flat Buoy.
„ Third Flat Buoy	„	No. 6 or Cliff Buoy.
„ Cliff Buoy.....	„	No. 7 or Outer Black Flat Buoy.
„ Outer Black Flat Buoy...	„	No. 8 or Inner Black Flat Buoy.

From the inner black buoy continue on the same course a quarter of a mile, then steer S.E. $\frac{3}{4}$ S. about one-third of a mile, until opening Brant Point enough to haul up S.S.W. $\frac{1}{2}$ W. into the harbour.

Middle Channel.—Find Buoy No. 9, by bringing the two small Bugs in range,† and run from that in a S.W. $\frac{3}{4}$ S. course to Buoy No. 10. From Buoy No. 10 steer S. by E. $\frac{1}{2}$ E. to Buoy No. 6 (or Cliff Buoy), and follow in by the Western Channel as before.

Eastern Channel.—Find the outer buoy of the Middle Channel as before, when the Old Bug will appear a handspike's length to the westward of Brant Light; steer in, keeping on this range, which leads into the Western Channel at Buoy No. 7 (or outer black flat).

There is a small shoal to the northward of Brant Point, which will be avoided by shutting in Old Bug Light on a house nearly in range to the northward. The best anchorage is near the wharves."

It appears that there is (1857) a channel eastward of this Eastern Channel, in which a vessel will have a depth of not less than 5 feet at low water on the bar. Commander Caldwell says, "In coming in, bring Brant Point light to bear South, and run for it, until the two lights (one red and the other white) are in range.‡ Run in on this range until the beacon light at the head of the harbour is nearly in range, but open a little eastward of Brant Point light; then run in on this range, gradually opening the beacon more to the eastward until it shuts in behind the farm-house; then run southward into the harbour."

In proceeding to sea from Nantucket Harbour, the course from the bar towards the

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* We believe one is a *red* light.

† The direction of these lights has been altered since the above was written, but the buoy lies, or did lie, with Old Bug light nearly in line with Brant Point light.

‡ Bearing S.W.

N.E. or Great Point Lighthouse, will be nearly N.N.E. With the tide setting westward, run for the lighthouse, and pass the point at the distance of about 2 miles, leaving Great Point Rip on the starboard side. Be cautious that a tide setting eastward does not drive you on the Rip. Keep the town of Nantucket open to the westward of the lighthouse on the Great Point, until you are 3 miles to the N.N.E. of that point, when you will be in fair ship channel for proceeding either eastward or westward. An E. by S. course will thence carry you to sea, to the southward of the Great Round Shoal, the black buoy on which will be passed at a good distance. With a light wind and a southerly tide, there will be a risk of being set too near the Great Point Rip or on to M'Blair's Shoals; it will, therefore, be necessary to keep a good look-out for the red buoy on the end of the former, and when you are to the eastward of it, to keep Great Point Lighthouse bearing southward of West. As soon as Sankaty Head bears S.W. ¼ W. you will be clear of all danger, and may steer to the northward or eastward as desirable. See the directions for entering by this channel, page 107.

EDGARTOWN.—This harbour is situated on the north-east side of Martha's Vineyard, and is considered to be the best harbour in the island. It is formed by the eastern part of Martha's Vineyard and by the western shore of Chappaquiddick Island, and its entrance is, therefore, westward of Cape Poge, between it and a flat that runs off about 2 miles northward from Eel Pond Point, which has from 3 to 15 feet upon it, and is marked by several buoys and a spindle. The average breadth of the harbour is ⅝ of a mile, and the soundings vary from 3 to 7 fathoms, soft and sticky bottom, but abreast the town the width does not exceed a cable's length, nor the depth 5½ fathoms, and just before you arrive at the wharves you will pass over a bar whereon the least water is 15 feet. There is a passage out to the southward, through Cotamy Bay, but, we believe, it is very seldom used, and is in many parts very shallow. As before observed, there is said to exist at certain stages of the tides a large difference of level between the waters of Nantucket Sound and those of the open sea to the southward, which causes a rush of water through Muskeget Channel; it is most probably to this circumstance that the harbour of Edgartown owes its depth of water, its northern and southern openings connecting the sound with the ocean. On the days of full and change, high water takes place at 12h. 16m.

Rise of highest tide observed above the plane of reference		3.4 feet.
Fall of lowest tide observed below the plane of reference		1.2 „
Fall of mean low water of spring tides below the plane of reference		0.2 „
Height of mean low water of neap tides above the plane of reference		0.2 „
Mean rise and fall of tides		2.0 „
Mean rise and fall of spring tides		2.5 „
Mean rise and fall of neap tides		1.6 „
Mean duration of rise	Reckoning from the middle of one stand	6h. 51m.
Mean duration of fall	to the middle of the next	5h. 29m.
Mean duration of stand		0h. 24m.

The direction of the current does not always correspond to the rise and fall of the tide. The time of the outward (or northerly) direction of the current exceeds that of the inward in the proportion of 3 to 2 nearly.

The fixed light on Cape Poge has already been described, page 105. On the end of the pier that runs 1½ cable to the eastward from the western shore of the harbour, immediately northward of the town, there is a fixed light shown from the top of the keeper's dwelling, 37 feet above the sea level; the building has a white appearance, and the light may be seen at a distance of 12 miles.

Having followed the directions for Nantucket Sound (page 107) till off Cape Poge, and coming from the westward, pass to the northward of the outer buoy (red), and if from the eastward, give Cape Poge a berth of half a mile. Steer then S. by W. or S.S.W., keeping in not less than 4 fathoms, soft and sticky bottom, until up with the middle buoy (red), whence you steer S.S.W. towards the lighthouse. Give the buoy off the lighthouse a small berth on the starboard hand and enter in mid-channel. If intending to anchor above the first wharf, keep near the wharves to avoid the shoal off the inner point of Chappaquiddick. In the night, after passing the outer buoy, or Cape Poge, make use of the lead, and tack when the bottom changes from soft to hard, especially on the western side, where the water shoals suddenly from 5 fathoms to 12 feet. After Cape Poge bears E. by S., the course changes from S. by W. to S.S.W.,

and in sailing up you must observe the before-mentioned precautions as to making use of the lead. There is good anchorage off the town in from 3½ to 4 fathoms.

If intending to anchor in the outer harbour, follow the above directions until the harbour light bears W. by S., and Cape Poge Light about N.E. by E. ¼ E., when you may anchor in 4½ or 5 fathoms water, good holding-ground. When anchoring, be careful, as the bank on either side is steep-to.

HOLMES' HOLE.—This is a harbour lying on the north side of Martha's Vineyard, and is very useful to those frequenting Vineyard and Nantucket Sounds, as it is a place of shelter easy of access. It is well protected from all points except the north, to which direction it is quite open. Its entrance, between the East and West Chops, is 1¼ mile wide; thence to the head of the harbour, where the width is only ¼ of a mile, the distance is about 1½ mile. Soundings of from 6 to 3 and 2 fathoms may be had up to abreast the town, gradually decreasing as you advance inwards. On the East Chop a telegraph has been erected, and on the West Chop a white lighthouse, which exhibits a fixed light at 60 feet above the sea, visible to the distance of 12 miles.

Time of high water on the days of full and change	11h. 43m.
Rise of highest tides observed above the plane of reference	3.1 feet.
Fall of lowest tides observed below the plane of reference	0.8 „
Fall of mean low water of spring tides below the plane of reference	0.1 „
Height of mean low water of neap tides above the plane of reference	0.2 „
Mean rise and fall of tides	1.7 „
Mean rise and fall of spring tides	1.8 „
Mean rise and fall of neap tides	1.3 „
Mean duration of rise / Mean duration of fall (Reckoning from the middle of one stand to the middle of the next)	6h. 41m. / 5h. 21m.
Mean duration of stand	0h. 11m.

If from the eastward, follow the directions for Nantucket Sound given on page 107, and when abreast East Chop haul in to the southward. When coming in from the westward bring the East Chop well open with the West Chop lighthouse, and it will lead you clear of the Middle Ground. See the directions for Vineyard Sound. Give the West Chop a berth of half a mile, until you are past the buoy marking the rocks off that chop. You can beat in by the lead with perfect safety, the shores being tolerably bold and clear. You can anchor in 3 fathoms, mud, with the West Chop light just open of the woods on Low Point. Small vessels may anchor farther in, and immediately off the town. If you make the light on the West Chop in the night, bearing S.E., you will be clear of the Middle Ground, and may steer for the east side of it till you get into 4 or 3 fathoms on the flat near the chop, and then steer S.E. by E., taking care not to approach the land nearer than in 3 fathoms; but, if in running S.E. by E. the water should deepen to 6 or 7 fathoms, haul up S. by W. or S.S.W. to 4 or 3 fathoms, as above directed.

POWDER HOLE is formed by a small curve of the land to the westward and northward of the south end of Monomoy Island, and immediately westward of the lighthouse; it affords a snug anchorage for a few small vessels in from 12 to 18 feet, sheltered from all but northerly and north-westerly winds. To proceed to this place steer W. ½ N. from Pollock Rip lightvessel up to the Shovelfull lightship and the black buoy on the south-west end of the Shovelfull Shoal, leaving in your course a black and white buoy on your starboard, and a red buoy on your port hand. From the Shovelfull lightvessel haul up on a N. ½ W. course through the narrow but deep channel between the Shovelfull and Handkerchief Shoals, leaving the red buoy on the edge of the latter on your western side, and as the former shoal is very shallow and steep-to it will be necessary not to deviate much from this course, and to tack at the first shoal cast (under 4 fathoms) of the lead. When Monomoy lighthouse bears East steer N.E. till it bears S.E. by E. ½ E., then steer for the lighthouse, and when past Monomoy Point, which should have a berth of 50 yards, haul in to the southward, and anchor close inside the point in 2½ fathoms, to avoid the flats to the eastward.

OLD STAGE HARBOUR lies in the extreme north-east corner of Nantucket Sound, and is formed by the extensive flats which project from the eastern and northern shores, which make a kind of basin with an entrance above a mile in width, and open to the south-westward, the eastern and western sides of which are marked by two buoys, the red to be left to starboard and the black to port when entering. Anchorage may be

had in this harbour in about 4 fathoms water, good holding ground, but exposed to all winds from the southward and westward. Bound to this place from Butler's Hole, proceed on the before-mentioned N. ½ W. course from Shovelfull lightvessel till Monomoy lighthouse bears East, when a N.W. by W. direction should be followed to clear the north end of Handkerchief Shoal, and as soon as Monomoy light bears E.S.E. ½ E. steer North a little westerly, leaving the buoys on Roger's Shoal to starboard, and bringing the said light to bear S.E. ½ S., then a N.E. course will lead to the anchorage.

Bass River, on the northern shore of Nantucket Sound, will itself only admit very small craft. Before its mouth is a well sheltered roadstead in 15 and 16 feet, except against southerly gales, which bring in a heavy sea, rendering the anchorage insecure. Here there is a small breakwater behind which vessels anchor in 6 or 8 feet at low water. Those of light draught may run up close under the breakwater to the eastward of it. A fixed light is shown from a white tower on the keeper's dwelling, situated about a mile eastward of the river's entrance, at the height of 40 feet above the sea, which is visible in clear weather at from 8 to 10 miles off. Vessels approaching from the westward should bring the light to bear N. by E. to clear the east end of the breakwater, and those approaching from the eastward should bring the light to bear N.W. before running in for the anchorage.

HYANNIS HARBOUR, also on the northern shore of Nantucket Sound, is formed by the point or peninsula of Gammon on the eastern, and the S.W. Ground on the western side. In the fairway up to and within the small breakwater there are from 15 to 18 feet water, and at the head of the landing wharf from 4 to 6 feet. The deep-water space for anchoring inside the breakwater is, however, very confined, being not more than ⅓ of a mile in extent, the shallow flats from both shores, especially the Point Gammon side, encroaching upon it and thus limiting its area. High water here on full and change days at 12h. 22m.

Rise of highest tide observed above the plane of reference		5.34 feet.
Fall of lowest tide observed below the plane of reference		1.03 „
Fall of mean low water of spring tides below the plane of reference		0.32 „
Height of mean low water of neap tides above the plane of reference		0.19 „
Mean rise and fall of tides		3.2 „
Mean rise and fall of spring tides		3.9 „
Mean rise and fall of neap tides		1.8 „
Mean duration of rise	reckoning from the middle of one stand to	6h. 44m.
Mean duration of fall	the middle of next	5h. 41m.
Mean duration of stand		0h. 9m.

The lighthouse, showing a revolving light with a bright flash every ½ minute, on the Bishop and Clerks' Ledge, has been described on page 105. The harbour light, called also the Bug Light, is situated on the mainland, inside the breakwater; the building is coloured white, and the light a fixed one, elevated 36 feet above the mean level of the sea, is visible to the distance of 8 miles in clear weather.

The dangers in the way of vessels entering Hyannis Harbour are:—the *Bishop and Clerks*, now distinguished by a granite tower on their northern part serving as a lighthouse, which bears S. by E. nearly 2½ miles from Point Gammon; by giving this lighthouse a berth of ¼ of a mile on the east, north, and west sides, and of one mile on the south side, vessels will pass clear of the rocks in not less than 14 feet. The *Senator Shoal* and *Gazelle Rock*, which lie off the southern side of Point Gammon, and are both marked by buoys, that on the former lying nearly a mile in a south-easterly direction from the point, the other inside it and nearer the point; both buoys should have a good berth on your northern side. The *Middle Ground*, which is about a mile in extent from N.W. by W. to S.E. by E., has 15 to 18 feet water on it, excepting at its eastern end, where there is a spot of 12 feet, which lies W. by N., 1½ mile, from the lighthouse on the Bishop and Clerks; this spot is marked by a striped buoy. The *S. W. Ground*, a flat of from 7 to 10 feet, water running off 1½ miles southward from the west side of the harbour, with several rocks upon it, the outermost group of which, named Gallatin, lies W. ½ S. from the buoy on the south-east corner of the ground, and N.W. by W. ½ W. from the Gangway buoy. The *Gangway Rock*, a patch of 10 feet, is situated on the W.S.W. Ledge, outside the S.W. Ground; the buoy on it bears W. by S. ½ S. from Point Gammon, and N.W. by W. ½ W. from

Bishop and Clerks' lighthouse. The *Great Rock*, above water, which lies on the eastern side of the passage into the harbour, S. ¼ W. 1⅓ mile from the Bug Light. And the *Half-tide Rock* lying S.E. ¼ E. ¼ of a mile from the Great Rock, and N.W. ¾ W. from Point Gammon.

DIRECTIONS.—Bound to Hyannis from the eastward, follow the directions given on page 107 for vessels sailing through the north channel of Nantucket Sound, till abreast of Bishop and Clerks' lighthouse. Or, from the Handkerchief lightvessel steer N.W. towards the said lighthouse, and give it a berth on your port hand of ½ a mile or more. Or, if from the southward and eastward, and in a position off Great Point, with its lighthouse bearing South, distant about 3 miles, steer N.W. by N. towards the Bishop and Clerks, and round them at the same distance.

To sail through the *North Channel*, or that between the Bishop and Clerks and the Senator Shoal, having proceeded on either of the two latter courses, till the Bishop and Clerks' lighthouse bears W. by N. about ¾ of a mile distant, steer N.W. ½ W. about 3 miles, until Point Gammon bears E. by N. ½ N., and the Bug Light is in one with the west spire of Hyannis; here the east end of the breakwater will be in one with the second small windmill of the salt-works westward of the Bug Light, and on with the end of the wharf, bearing N. ¾ E. Run in with this latter mark on (N. ¾ E.) about 1⅓ mile, double close round the east end of the breakwater, run N.N.W., a cable's length or so, and anchor in 16 feet water on a muddy bottom.

If bound into Hyannis by the *Middle Channel* (the one between the Bishop and Clerks and the Middle Ground), pass at least one mile to the southward of the Bishop and Clerks' lighthouse, leaving the buoy on the south extreme of the reef on the starboard hand, and bring Point Gammon to bear N. by E.; run in on that course until the lighthouse on the Bishop and Clerks bears E. ½ S., distant nearly one mile, when you steer N.N.W., 2 miles, leaving the striped buoy on the Middle Ground ⅓ a mile to port, until Point Gammon bears E. by N. ½ N., distant 1⅓ mile; you now proceed as before.

If bound in by the *West Channel* (the one between the Middle Ground and the W.S.W. Ledge), proceed from Vineyard Sound up to Succonesset lightvessel by reversing the directions on page 108, and from that lightship steer E. by N. ½ N., and when Point Gammon bears N.E. by E., distant 2½ or 3 miles, run on that course, leaving the Gangway buoy three-fifths of a mile to the northward and westward, until the Bug Light is just open to the westward of the West Spire, and the east end of the breakwater is on with the second windmill westward of the Bug Light, when you may run N. ¾ E., as before.

To sail from Holmes' Hole to Hyannis, steer E. by S. ½ S., 5½ miles, passing between the red buoys on the east and west end of the Squash Meadow and the striped buoy on the east end of Hedge Fence; Cape Poge lighthouse will then bear S. by W., distant 2⅓ miles. Or, from the entrance of Edgartown Harbour steer N.E. to the same position off the lighthouse. Now shape a course towards Succonesset lightvessel, steering N. by E. or N. by E. ½ E., and when up with it, leave it a short distance on the port hand and steer E. by N. ½ N., as before, leaving the red buoys on Eldridge and on the north-west end of Horse Shoe Shoal on the starboard hand. You will know when you are off this end of the Horse Shoe by your water deepening to 9, 10, and 11 fathoms. In turning to windward do not approach the Horse Shoe nearer than into a depth of 10 fathoms, nor to the shore than into 3½ fathoms. In working up Hyannis Harbour, when abreast of the S W. Ground, do not approach nearer than 2½ fathoms to either shore. When to the northward of the Great Rock, the eastern mark is the Bug Light on with West Spire; and when to the northward of the buoy on the south-east end of the S.W. Ground, the western mark is the west end of the breakwater on with Bug Light.

VINEYARD SOUND, the western channel to or from Nantucket Sound, runs in E.N.E.-ward, between Martha's Vineyard and the Elizabeth Islands, which latter separate it from Buzzard's Bay. Its length is 15 miles, the average breadth about 4 miles, and the soundings range from 10 to 16 fathoms, except in the immediate vicinity of the shoals. The Elizabeth Islands are 6 in number, and form a narrow chain of 1½ mile in breadth, and 14 miles in length, extending in an E. by N. ½ N. and W. by S. ½ S. direction. The principal dangers in the sound are, the Devil's Bridge, the Sow and Pigs, Lucas Shoal, and the Middle Ground. The only places of importance are Wood's Hole and Tarpaulin Cove, but good anchorage may be had with

south-westerly, southerly, and easterly winds in Menemsha Bight, eastward of Gay Head.

Tides.—At the eastern or Nantucket entrance of Vineyard Sound it is high water on the days of full and change at about 10h., and at the western entrance at 7h. 45m. The flood runs E.N.E.-ward, and the ebb the contrary; the latter, however, has a tendency on the western side of the sound to carry a vessel towards the small channels between the Elizabeth Islands and over the Sow and Pigs Reef, which influence should be guarded against when in their vicinity. The velocity of the eastern stream is about a mile an hour off Gay Head, which rate increases to $1\frac{3}{4}$ and 2 miles as you advance towards Nobska Point; off this latter point the western stream in the main channel is at times very strong, attaining a rate of nearly 3 miles, but decreasing again in the middle and western part of the sound, where its greatest velocity is $2\frac{1}{3}$ and $1\frac{1}{4}$ mile per hour. The eastern stream continues to run for $6\frac{1}{4}$ hours, and the western for $5\frac{3}{4}$ hours.

Lights.—The light on West Chop has been described on page 106.

Nobska Point bears N.W. $\frac{1}{2}$ N., 3 miles from the West Chop of Holmes' Hole, and is distinguished by a white building serving as the keeper's dwelling, on the top of which, at the height of 80 feet above the mean level of the sea, there is a black lantern exhibiting a fixed light, visible to the distance of 13 miles. This light serves as a valuable leading mark for Nantucket and Vineyard Sounds, as well as a guide to Wood's Hole, the entrance to which little harbour lies on its western side.

Tarpaulin light is fixed, shown from the same height, and visible to the same distance as Nobska Point light. The building has a white appearance, stands on the south-west side of Tarpaulin Cove, near the middle of the eastern side of Naushon Island, and bears from Gay Head N.E. $\frac{3}{4}$ N., 8 miles distant.

Gay Head, the western extremity of Martha's Vineyard, has a brown-coloured brick tower upon it, exhibiting a revolving light, showing a bright flash every 10 seconds. The light being 170 feet above the sea may be seen at the distance of 19 or 20 miles in clear weather. The cliff over which the lighthouse stands is 130 feet high and very conspicuous, as it appears of various colours, namely red, white, and yellow, owing to the different strata of earths.

Cuttyhunk lighthouse stands on the south-west point of Cuttyhunk Island, the westernmost of the Elizabeth Islands, and consists of a white brick and stone tower 32 feet high, surmounted by a black lantern, from which a fixed light is shown at the height of 42 feet above the sea, visible 12 miles.

Vineyard Sound lightvessel is moored in $13\frac{1}{2}$ fathoms off the south-west end of Sow and Pigs Reef, with Cuttyhunk lighthouse bearing N.E. by E. $\frac{1}{2}$ E., $2\frac{1}{2}$ miles, and Gay Head S.E. by E. $\frac{1}{2}$ E., $7\frac{1}{2}$ miles. The hull of the vessel is painted red with a white streak, and has the name on each side. There are two fixed lights exhibited from the mast-heads, one 34 and the other 23 feet above the sea, each visible at from 9 to 11 miles. In the daytime one red ball is hoisted at each mast-head, and a bell rung and a horn sounded every alternate five minutes in foggy weather.

Dangers.—As before observed, the principal dangers in Vineyard Sound are, the Middle Ground, Lucas Shoal, the Devil's Bridge, and the Sow and Pigs Reef.

The Middle Ground, the eastern end of which lies N.W. from the lighthouse on the West Chop of Holmes' Hole, at $\frac{1}{4}$ of a mile from the nearest shore, leaving a narrow but deep channel between, extends E. by N. and W. by S. $4\frac{1}{2}$ miles, and has several swatchways through it. The east end, now distinguished by a striped buoy, has only from 5 and 6 to 10 feet over it, and may be avoided by keeping the East Chop open north of the West Chop. About a mile from the eastern end of the bank there are but 2 feet, and on its west end only 14; here there is also a striped buoy, lying above a mile from the nearest part of Martha's Vineyard. Both sides are very steep, and should be cautiously approached, 9 or 10 fathoms being sufficiently near on the northern side.

Lucas Shoal may almost be considered as part of the Middle Ground, being separated from it only by a continuous line of soundings varying from 4 to 5 fathoms. It is small, steep-to, has only 14 feet over it, and on its western side marked by a striped buoy, which bears about S. $\frac{1}{2}$ E. $2\frac{1}{2}$ miles from Tarpaulin lighthouse, S.W. by W. a similar distance from the striped buoy on the west end of the Middle Ground, and $1\frac{1}{2}$

mile off the nearest part of the shore of Martha's Vineyard, with from 5 to 18 fathoms between. There is a small isolated patch of 18 feet 1⅓ mile S.W. by W. ½ W. from Lucas Shoal, with 5 and 7 fathoms between.

The *Devil's Bridge*, a broad ridge of rocks extending north-westward ½ a mile from Gay Head, has a red buoy on its extremity, but being steep-to, vessels should exercise considerable care in rounding the head, giving it a berth of one mile or more.

The *Sow and Pigs Reef* is formed of rocks of various shapes and sizes, resting on a hard bed of mixed rock and pebbles, with the interstices filled with sand and clay. The rocks extend from the West Bluff of Cuttyhunk Island, the westernmost of the Elizabeth Isles, in nearly regular succession, first W. by S. about 1600 yards, then S.S.W. 820 yards, and terminate in a S.W. by W. direction 550 yards. The general direction and length of the reef, measuring from Cuttyhunk Island, is S.W. by W. ½ W. 1⅔ mile. Small vessels whose masters are acquainted sometimes pass over the middle of the reef, through a swatchway wherein are from 12 to 17 feet, and sometimes between the red buoy on its extremity and the lightship; but strangers should always pass outside and southward of the lightvessel. Southerly and westerly winds always cause a heavy swell, while those from the north-westward and eastward maintain a smooth gentle sea. The first of the flood sets strongly to the northward over this reef into Buzzard's Bay, and, therefore, caution is required to counteract its influence when in this vicinity at such a time.

DIRECTIONS.—Having followed the instructions for sailing through Nantucket Sound up to West Chop and Nobska Point, given on page 107, if from the main channel through that sound, and steering on the last-mentioned (N.W. by W.) course, as soon as you are about a mile S.E. by E. from Nobska lighthouse, alter your course to W.S.W. Or, if from the north channel of that sound, from between L'Homme de Dieu Shoal and the main of Massachusetts, steer West towards Nobska lighthouse, and when it is distant 1½ mile from you on that bearing, haul up W.S.W., as before. Continue on this W.S.W. course, and you will pass from 1 to 1½ mile northward of the striped buoys on the west end of the Middle Ground and Lucas Shoal, from 3½ to 4 miles northward and westward of Gay Head, and about a mile eastward and southward of Tarpaulin light. When Cuttyhunk lighthouse bears N.N.E. and the Sow and Pigs lightvessel N.N.W., you will be in a depth of 14 or 15 fathoms, and may steer W.N.W. towards Newport Harbour, West for the channel on the north side of Block Island, and W.S.W. towards the south side of Block Island and Montauk Point.

Vessels from the westward, bound through Vineyard and Nantucket Sounds to the eastward, or to any of he ports in the same, will find no difficulty in reversing the foregoing directions and those given on page 106.

Coming from the southward and eastward, you may run for the light on Gay Head, when it bears from N.N.E. to E.S.E., giving it a berth of about 2 miles, to clear the Devil's Bridge, which extends from the light N.W. by N. nearly a mile. As the distance cannot be exactly ascertained in the night time, you should, at that time, keep the lead going; and if, when the light bears S.E. by E. or S.E., you fall into 7 or 8 fathoms, haul up to the northward until you deepen to 10 or 12; if then it be flood-tide, steer N.E.; but, if ebb, N.E. by E., 3 leagues. E.N.E. will then be the course for Vineyard Sound, and it will carry you to the northward of the Middle Ground, until you see the light on the west chop of Holmes' Hole Harbour, towards which you may then run in, observing only to keep one mile from the shore, until the east chop appears a cable's length open; when with the tide of flood you may steer directly for it, with the ebb, however, keep it one point open, until you have a windmill open about a cable's length on the west side of the harbour. You may now run up in the middle of the harbour, till you get in a depth of 4 or 3 fathoms, when you anchor in good ground. See page 111.

If coming into the Sound in the night, with a strong north-westerly wind, haul to the northward until you have smooth water under the Elizabeth Islands, where you may anchor in from 14 to 10 fathoms. With the wind to the southward, if at all acquainted, it is best to run through the *South Channel*, between the Middle Ground and Martha's Vineyard: but observe to approach the island no nearer than to the depth of 7 fathoms, until you are abreast of Lumbert's Cove, in which there is a good anchorage with southerly and easterly winds.* This place may be known by a high

* When making for this place or channel, remember the position of Lucas Shoal, &c. See page 114.

sand-bank named Necunkey Cliff, on its eastern side; mid-way in the cove is the best anchoring, in from 5 to 3 fathoms, sandy ground. The western end of the Middle Ground lies about 1¼ mile without the cove, and has from 9 to 14 feet water over it. Should you intend to proceed hence towards Holmes' Hole, the course from opposite Necunkey Point will be about E. by N., keeping sufficiently near the land to clear the Middle Ground. You may run along by the lead, in from 7 to 4 fathoms until you approach nearly to the West Chop, in the depth of 3 fathoms. With this depth you may round the chop in the same manner as when running down from the north side of the Middle Ground. Along the shore, between Necunkey Point and the west chop, there is good anchorage in from 6 to 4 fathoms.

WOOD'S HOLE.—This place is immediately westward of Nobska Point lighthouse. It has two entrances, one from Vineyard Sound, between Nobska Point and Nonamesset, the easternmost of the Elizabeth Islands, and the other from Buzzard's Bay, between Long Neck and Uncatena Island. Thus Wood's Hole serves as a harbour, and also as a channel for small vessels passing from the sound into the bay, or *vice versâ*. There are two harbours, both on the eastern side of the channel, and named Great and Little Harbours. Great Harbour, on the south-east side of Long Neck, affords anchorage in from 4 to 8 fathoms, but is open to southerly winds; its length is ⅓ and breadth ¼ of a mile, the principal dangers are pointed out by buoys, and there is a landing-place, named Bar Neck Wharf, on its eastern side, nearly close to which are 5 and 6 fathoms water. Little Harbour, separated from the Great Harbour by Parker's Neck, has its entrance ½ a mile north-westward of Nobska lighthouse, runs in about ⅓ of a mile to the northward, and is, therefore, also open to southerly winds, is from 1 to 2 cables' lengths in breadth, and has a depth of from 6 to 10 feet at low water. It is high water on the days of full and change of the moon in the Vineyard Sound entrance at 8h. 34m., and in the Buzzard's Bay entrance at 7h. 59m.; the mean rise and fall of spring tides at the former place is 2 feet, neaps 1·23 feet; and at the latter 4·7 feet, neaps 3·14 feet. The fixed light has been before described on page 114.

Having arrived off Nobska Point by the directions given on pages 107 and 108, and intending to proceed into the Great Harbour by the Ship Channel, when off the harbour in 6 fathoms, bring a yellow house* at the head of the harbour to bear N. ¼ W. Steer for it, leaving a black buoy on the port hand, and two red ones to starboard, and when Bar Neck Wharf bears E.N.E. anchor. Or, steer N.W. for the inner harbour, and bring-to in from 4 to 8 fathoms. Red buoys mark the eastern and black the western limits of this channel, in which, if these courses are preserved, there is not less than 18 feet water, except on a patch lying nearly in mid-channel off the extremity of Parker's Neck, whereon are only 15 feet, which you will leave a little on your port hand. Another bearing for entering by this channel, from the above position off the harbour, is the Blacksmith's Shop on Bar Neck a vessel's length open westward of the bluff land of Parker's Neck. Continue on this course till the southern point of that neck comes in range with the church to the north-eastward, then steer for the eastern part of the breakwater until Bar Neck Wharf bears E.N.E., as before. In a small vessel, as soon as Parker's Point comes in line with the church, you may haul round to the eastward of it, giving it a berth of half a cable's length, and proceed up into the Little Harbour.

The Eastern Channel into Wood's Hole Harbours is only suitable for vessels of very light draught, there being but 8 feet over the bar which connects Parker's Neck with the Great Ledge situated in the middle of this entrance When entering by it give Nobska Point a berth of 2 cables on your starboard side, and steer N.W. by W., passing midway between the black buoy on the south-east part of Great Ledge and a red buoy marking a 3-feet patch lying off the mouth of Little Harbour. Haul up North if bound into the Little Harbour, or, continue on your course, give Parker's Point a berth of nearly a cable's length, and steer for the Great Harbour as before.

To pass from the Great Harbour into Buzzard's Bay when abreast Lone Rock spindle, bring the largest house on the high land of Parker's Neck to bear E. ¼ N., steer W. ¼ S. so as to leave Lone Rock spindle and two black buoys almost close-to on the left hand, and when the bay is broad open, steer out N. by W. ½ W., leaving a red buoy about a cable's distance on your right, and a black one off the north-

* This house is the westernmost on Bar Neck; it has wings, and is one and a half storey high.

east point of Uncatena Island a similar distance on your left hand. See Wepecket Island, &c.

TARPAULIN COVE.—This cove is near the middle of Naushon Island, on the western side of the Vineyard Sound, and, although small, is yet a good place of shelter, as if you are well provided with ground-tackle you may ride out a heavy gale, the ground being excellent. The soundings in the cove are from 15 to 18 feet, deepening immediately outside to 8 and 10 fathoms, but there are some rocks lying nearly $1\frac{1}{2}$ cable's length from the shores of the cove which must be avoided. Near the light-house there is a rock of 7 feet, marked by a black buoy, to be left to port on entering. This cove is exposed to all winds between East and E.S.E. Vessels when at anchor here should moor in $5\frac{1}{2}$ fathoms with Gay Head Light just open with the lighthouse point.

High water on full and change days at 8h. 4m.; springs range $2\frac{3}{4}$, neaps $1\frac{3}{4}$ feet. The fixed light on the south point of the cove has been described on page 114.

Quick's Hole, the passage from Vineyard Sound into Buzzard's Bay between Pasque and Nashawena Islands, is but $\frac{3}{4}$ of a mile wide, though from 4 to 8 fathoms deep in the fairway. Its eastern entrance is N. $\frac{3}{4}$ E., 5 miles from Gay Head lighthouse, and distinguished by a black buoy on the southern and a red buoy on the northern side. Steer in midway between these buoys N.W. by N. till half-way through the Hole, then North into Buzzard's Bay, keeping as nearly as possible the middle of the channel throughout, or, if obliged to deviate at all, approach nearer the western rather than the eastern shore, following somewhat the bend of that coast. Half a mile northward of the western entrance there is a small and steep rocky patch of $3\frac{1}{2}$ feet, marked by a striped buoy, to which a berth should be given on either hand.

MENEMSHA BIGHT, immediately north-eastward of Gay Head, affords good anchorage in from 5 to 9 fathoms, about $2\frac{1}{2}$ miles eastward of the lighthouse, with the wind from East, round by South, to S.W., but being much exposed to the influence of northerly winds, it should be resorted to only in the summer, or at other times from necessity. There is no danger in the bight, except the flat lining the shore, which may be avoided by giving the land a berth of $\frac{1}{2}$ a mile, or by not going into less than 5 fathoms. When rounding Gay Head for this bight give the lighthouse a berth of $1\frac{1}{2}$ mile or more to avoid the Devil's Bridge, the extremity of which is pointed out by a red buoy. From this anchorage to Tarpaulin Cove the course and distance are N.N.E., $6\frac{1}{2}$ miles, leaving the striped buoy on Lucas Shoal for $1\frac{1}{4}$ mile to starboard.

NO MAN'S LAND AND CHANNEL.—No Man's Land is a small island situated off the south-west end of Martha's Vineyard. It is about $1\frac{1}{2}$ mile in length and $\frac{3}{4}$ of a mile broad, and separated from Martha's Vineyard by a channel $2\frac{1}{2}$ miles wide, and from $3\frac{1}{2}$ to 6 fathoms deep; but there are two or three shallow and rocky patches which very much check its free use and makes it safer to pass outside the island if at all unacquainted. Almost close-to on the south side of the island there are soundings of 3, 4, and 7 fathoms, but a shallow flat lines its north-east side; temporary anchorage, however, may be had in 3 or 4 fathoms off its north-western shore when the wind blows from south or south-eastward. The Old Man and Lone Rocks, which occupy a position right in the fairway of the channel, and are, we believe, marked by buoys, divide it into two passages; to sail through the southern, keep at about $\frac{1}{2}$ a mile from the northern side of No Man's Land, until Gay Head light bears N. $\frac{1}{2}$ E., you may then steer N.N.W. for Vineyard Sound; and to sail through the northern give the east point of No Man's Land a berth of one mile, and steer N.W. by N. $\frac{1}{2}$ N., sailing along and almost parallel to the shore of Martha's Vineyard at about a mile distant therefrom, leaving the Old Man and Lone Rock buoys on the port, and the red buoy marking the edge of the shoal from Squipnocket Point on the starboard hand.

The bearing and distance from off the southern of the Nantucket Shoals to No Man's Land are about N.W. by W., 47 miles. If bound into Vineyard Sound with an easterly wind, run through the northern passage as above directed, and continue a N.N.W. $\frac{1}{2}$ W. course until you arrive at Gay Head Light. With an ebb-tide you may anchor in 5 fathoms, the light bearing North to N.E.

BUZZARD'S BAY, an extensive arm of the sea running in N.E. by E., 22 miles, being on the average $6\frac{1}{2}$ miles broad, and from 5 to 10 fathoms in depth, is separated from Vineyard Sound, as before stated, by a chain of islands, named the Elizabeth Islands, among which there are two principal channels of communication, called Wood's and

Quick's Holes, already described. There are several isolated and prominent dangers in the bay, and the majority of the projecting points have sand and rocky flats extending from them, which, although for the most part distinguished by buoys or beacons, render it necessary to employ either local knowledge, or to exercise the greatest caution. The principal places to which vessels resort are, New Bedford, Mattapoiset, Sippican, Wareham, and Monumet River. At the entrance it is high water on full and change days at 7h. 40m., and at the head of the bay about 20 minutes later, showing that the tide-wave reaches the shores at nearly the same time all round. The average set of the stream is said to be 1½ mile per hour.

LIGHTS.—The fixed light on the south-west end of *Cuttyhunk*, the westernmost of the Elizabeth Isles, has been described on page 114. When entering Buzzard's Bay bring it to bear East, distant 3½ miles, and then steer N.E. by E. *Ribbon Rock* (15 feet) lies N.W., 1½ mile from this light.

Round or Dumpling fixed light is placed on a white building serving as the keeper's dwelling, at the height of 42 feet above the sea, and is visible to a distance of 12 miles. It is situate on one of the Dumpling Rocks lying off Round Hill Point, on the western side of the approach to New Bedford, and 7½ miles N. by E. ¾ E. from Cuttyhunk light.

Clark's Point light is shown from a white tower 48 feet high, and built on the point forming the western point of entrance of New Bedford Harbour, 3½ miles, nearly N.N.E. from the Dumpling light, and 11 miles on a similar bearing from that of Cuttyhunk. The light is fixed, 57 feet above the mean level of the sea, and visible to the distance of 12 miles.

Mattapoiset, or Ned's Point, is a fixed light at the height of 43 feet, visible 11 miles; it is exhibited from a white building erected on the point of that name, on the northern side of the harbour, and is, therefore, about 16 miles within and on the west side of Buzzard's Bay.

Bird Island, about 2½ miles further towards the head of the bay, and also on its western side, is on the northern side of the entrance to Sippican Harbour, and has upon it a white stone lighthouse, exhibiting a light, revolving once in every 1⅓ minute, from a black lantern, at an elevation of 35 feet, visible 10 miles.

Wing's Neck, or Wenaumet Neck, at the head of the bay, and nearly opposite Bird Island, has a white dwelling house on its western extremity, on the top of which is a fixed light, 44 feet high, and visible 10 miles. This light and the revolving one on Bird Island serve as excellent guides to vessels bound up to the head of Buzzard's Bay in the night time.

DIRECTIONS.—It may be mentioned that the soundings across the entrance of Buzzard's Bay, between the Sow-and-Pigs on one side, and the Hen-and-Chickens on the other, and to some distance within, are very irregular, varying from 5 to 10 and 15 fathoms; the bottom generally hard.

From the *westward* and bound up Buzzard's Bay shape a course so as to bring Saughkonnet Point to bear north, distant 3 miles, then steer E. ¼ N. till Cuttyhunk lighthouse bears S.S.E., leaving the bell buoy,* lying off the extremity of the Hen-and-Chickens, about a mile distant on the port, and the striped buoy on the Ribbon Reef a similar distance on the starboard hand. Now change your course to N.E. by E. ½ E., passing 1½ mile westward and northward of the small island named Penikese,† and leaving the black buoy on Mushaum Ledge, 1¼ mile, and the striped one on Wilkes' Ledge, one mile distant on your western side. Having followed this latter direction for nearly 10 miles, it will carry you well outside all the dangers before the entrance of New Bedford,‡ and up to abreast the black buoy on the extremity of the ledge running ⅞ of a mile southward from West Island, and to where Clark's Point lighthouse will be

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* It consists of a black can buoy, with a bell weighing 300 pounds secured on its top in an iron frame, surmounted by a hoop iron day-mark, and is moored in 7 fathoms water about ½ of a mile S. by E. from the Old Cock, and N. by W. from the Vineyard or Sow and Pigs lightvessel. It is tolled by the action of the waves and winds, and can be heard in ordinary weather about one mile.

† N.W. ⅞ of a mile from the north extreme of Penikese there is a small isolated rocky patch of 19 feet, with deep water close-to all round; and ⅜ of a mile N. by E. from the same point is a similar one of 21 feet water; these positions should therefore be avoided by deeply-laden vessels, and those of heavy draught.

‡ Except one 18-feet rocky patch, which is small, steep-to, and lies S.E. ¼ E., 4¼ miles from Clark's Point Lighthouse; this you will leave only about ¼ of a mile distant on your port hand, if the above course be made good.

seen bearing N.W. by W. Hence you may steer N.E. towards the head of the bay, passing at a good berth on your port hand, in successive order, the spindle on the Cormorant Rock, the striped buoy on Nye's Ledge, the black buoy on Bobell Rock, and Bird Island lighthouse; and on your starboard side, when near Bird Island, the black and the red buoys on the edge of the shoal fronting Scraggy Neck, and Wing's Neck lighthouse. Between these two lighthouses your soundings will be 4 and 5 fathoms, gradually decreasing as you approach the broad and shallow flat occupying the head of Buzzard's Bay, over which are the channels to Wareham Harbour and Monumet River. Even if no pilot has yet been obtained, it will be necessary for a stranger now to get such assistance in order to proceed to either of these places. Bound to New Bedford, Mattapoiset, or Sippican, and having followed the above instructions till you arrive off the entrance of the one you are bound for, then proceed as subsequently directed in the description of those places.

Vessels from the *eastward* sometimes enter Buzzard's Bay through Quick's Hole (see page 117), taking care, in passing out of it into the bay, to keep Gay Head Light open about a ship's length by the south-east point of Nashawena, till you are at least one mile north of the Hole, and this will carry you to the eastward of the Lone Rock, which lies about ½ a mile from it, has only 3½ feet of water over it, but there is a good channel on either side and 5 fathoms close-to all round. This rock, however, is now distinguished by a red and black striped buoy, and, therefore, can the more easily be cleared on either hand. From the Lone Rock, bound to New Bedford, steer N. ½ W. 5 miles, towards Clark's Point lighthouse, or till you strike hard bottom in 5 or 6 fathoms, on the south-east corner of the Great Ledge, which is on the western side of the channel, pointed out by buoys, and situated rather more than one mile eastward of Dumpling lighthouse; then N.E. by N., about a mile, till in 6 or 7 fathoms, sticky bottom, when the light on Clark's Point will bear N.N.W., and you will be at the entrance of the eastern channel, and may proceed as hereafter directed. But if bound up the Bay, from the Lone Rock steer N.E. by N. till up with the black buoy on the south-east end of West Island Ledge, when Clark's Point lighthouse will bear N.W. by W., and you may proceed as before.

The channel from the eastward, as above, is considered to be the best; but if circumstances render it more convenient, you may proceed to the northward of the Elizabeth Isles, by first passing to the southward of the Sow-and-Pigs lightvessel, and run N.E. by N., with the Dumpling lighthouse in this direction, leaving Ribbon Reef striped buoy to the eastward of you, and when Pune or Penikese Island bears E.S.E., you may change your course to N.E. by E. ½ E., and proceed up the bay as directed for vessels coming from the westward. If running for New Bedford, as soon as Clark's Point lighthouse bears N. ½ W., at which time Gay Head light will bear South, steer for it till you strike hard bottom in 5 or 6 fathoms off the south-east corner of the Great Ledge, then haul up N.E. by N. about a mile, and when Clark's lighthouse is seen bearing N.N.W. you will be at the entrance of the eastern channel into that harbour, as before.

PENIKESE CHANNEL, the passage between Penikese Island and Cuttyhunk and Nashawena Islands, has from 4 to 6 fathoms water in it, and is considered safe and reliable for vessels of the greatest draught beating up the bay or bound for New Bedford, but is so confined by isolated rocks and the shoals extending from the islands, that it cannot be recommended to strangers. Vessels sailing through to the eastward leave the black buoys on the northern and the red ones on the southern side, passing the striped buoy on Middle Ledge on either hand as most convenient.

Cuttyhunk Harbour, between Nashawena and Cuttyhunk Islands, in which there is good anchorage in from 2 to 4 fathoms, has its entrance from this channel; when going in take care to leave the red buoys on Whale Rock and Pease Ledge on the starboard hand.

NEW BEDFORD, a place of considerable trade, is situated on the western shore of Buzzard's Bay. Generally speaking, its harbour may be considered as comprised between Round Hill and Dumpling Rocks on the western, and Sconticut Neck on the eastern side. Between these points there are a great number of rocks and rocky ledges which divide the entrance into several channels: the three principal and the most used are, the Eastern, between the ledges off Sconticut Point and the North Ledges; the Middle, between the North and Great Ledges; and the Western, between Sandspit and Dumpling Rocks. All of these have from 4 to 6 fathoms in them. Within are Pandanaram Harbour, on the western side, wherein are from 16 to 10 feet water; Clark's

Cove, leading up to the south side of the town of New Bedford, and possessing a depth of from 18 to 10 feet, over a hard bottom; and the outer and inner harbours of New Bedford proper, the former consisting of the space between Clark's Point and Egg Islands and Flat, up to Fort Flat and Palmer's Island, and having soundings in it ranging from 15 to 24 feet, also over a hard bottom, and the latter of the space inside Palmer's Island and between the towns of New Bedford and Fairhaven, over the greater part of which, however, are but from 9 to 12 feet, except in the pool immediately off Palmer's lighthouse, wherein are 3 and 4 fathoms. Vessels, therefore, under the charge of a pilot, may run up into the inner harbour and have not less than 16 feet at low water all the way.

On the days of full and change, high water takes place at the entrance at 7h. 57m.

The rise of the highest tide above the plane of reference ...	6·2	feet.
Height of mean low water „ „ „ ...	·8	„
Height of mean high water „ „ „ ...	4·5	„
Mean rise and fall of tides	3·7	„
Mean rise and fall of spring tides	4·6	„
Mean rise and fall of neap „	2·8	„
Mean duration of flood } reckoning from middle of one }	6h. 50m.	
Mean „ of ebb } slack to middle of next ... }	5h. 33m.	
Mean „ of slack	0h. 42m.	

The strength of the flood is about $\frac{1}{8}$ of a mile an hour, and of the ebb about the same, except in the Western Channel, off the Dumpling Rocks, where it attains a rate of $\frac{1}{3}$ to $\frac{1}{2}$ a mile. It should be remembered that at the entrance the last of the flood and first of the ebb sets athwart the channels and over the various ledges, though at other times their direction is nearly the same as that of the channels themselves. The tides are sometimes very much forced down in the inner harbour by N.W. winds. From the soundings before given deduct $\frac{7}{10}$ of a foot for low spring tides, and $1\frac{2}{5}$ for storm tides.

As before stated, (page 118) the fixed light on Dumpling Rocks is shown from the top of the keeper's dwelling-house at the height of 42 feet; Clark's Point, also fixed, at an elevation of 57 feet; and that of Palmer's Island at the height of 32 feet, from a white building erected on the north-east extremity of the island, opposite the town. The former two are visible to a distance of 12 miles, but the last to not more than 9 miles. Clark's Point and Palmer's lights in range lead up to and through the Middle Channel clear of all dangers, passing, however, very close to the westward of the North Ledges.

For strangers entering New Bedford it is safest to employ a pilot, but should they be unable to get one, then it would be advisable for them to run in by the *Eastern Channel*, for which purpose, when up with the entrance as directed on page 119, bring the tall white beacon on the eastern side of the entrance to the inner harbour in range with the very high dark spire in Fairhaven, and steer for them N. $\frac{1}{2}$ W., passing between the buoys on Mosher Ledge and Henrietta and Packet Rocks, on the starboard, and those on the North Ledges, and Old Bartlemy, on the port hand, up to Butler's Flat, the buoy on the edge of which lies $\frac{3}{4}$ of a mile north-eastward of Clark's Point lighthouse, and must also be passed on the left hand. Now bring Palmer's light in range with a tall factory chimney (Wamsutta),* nearly N.N.W., steer for them, and pass in the best (16 feet) water between Butler's Flat and Egg Flat beacon up to near the southern end of Palmer's Island, or, anchor in from 16 to 20 feet to the westward of the beacon. From the south end of Palmer's Island steer towards the ends of Fairhaven wharves until half way between them and Palmer's light, then haul up towards the most northern spire in New Bedford, and anchor near the town in 8 or 9 feet at low water of spring tides.

Those at all acquainted mostly use the *Western Channel*, who, in running in from the southward and westward, give the bell buoy off the Hen-and-Chickens, and the black buoy on Mushaum Ledge, a good berth on the port hand, as already directed, steering N E. by N. towards Dumpling lighthouse,† and when Mushaum Point bears

* Wamsutta factory is a large stone building, with a very tall chimney on its eastern side; it is in the northern part of the town of New Bedford, and may be seen over Fairhaven Bridge.

† About midway between Mushaum Point and the Dumpling Rock is a small patch with only one foot over its shallowest part, which is marked by a buoy. Close-to all around there are 4 fathoms.

W. by S., bring White Rock open a ship's length eastward of the lighthouse, and steer to the northward, gradually keeping the rock more open as they advance, so as to pass between the Sandspit and Dumpling Rock buoys, and ¼ of a mile eastward of the light. When Dumpling light bears W. by N. they steer N.E. by N. for 3 miles, or until Clark's light is in range with Palmer's light, leaving Middle Ledge and Inez buoys a short distance to the westward; then N. by E., nearly, towards the beacon on the southwest end of Egg Island Flats, till Palmer's light comes in a line with Wamsutta factory chimney, then proceed as directed in the previous paragraph.

If using this channel in the night-time pass Mushaum Point with Dumpling and Clark's Points Lights in one, and when you are a mile from the Dumpling Light, steer N.E. ½ N. until it bears W.N.W., then steer past it, leaving it ¼ of a mile to the westward, and follow the directions already given.

To run through the *Middle Channel*, keep Palmer's light a handspike's length open eastward of Clark's Point light, about N. ¼ W., and you will pass up in the best water, between Great Ledge on the western side, and the North Ledges on the eastern. When 1¼ mile from Clark's Point light, the beacon on Egg Island Flats will bear N. by E., nearly; steer for it until Palmer's light and the chimney of Wamsutta Factory are in line, when you will be near Butler's Flat buoy, and may pass up to New Bedford as before.

MATTAPOISET.—Sconticut Neck, on the eastern side of the harbour of New Bedford, and West Island, form also the western side of a shallow bay, in which at present there is no place of any importance. Mattapoiset Neck, the next projection of the land to the north-eastward, and Angelica Point, constitute the western and eastern sides of Mattapoiset Harbour, which runs in about 2 miles north-westward, and has a depth decreasing from 5 and 4 fathoms at its entrance, to 3, 2, 2½, 1½, and 1 fathom at its head, abreast the wharves of the town. On Ned's Point, about a mile before you come to Mattapoiset, on the north-eastern side of the harbour, there is a white building surmounted by a black lantern, from which a fixed light is shown at an altitude of 43 feet above the level of the sea, visible to the distance of 11 miles. From this lighthouse the northern entrance to Wood's Hole bears S. by E. ¾ E., 8¾ miles; the spindle on the Cormorant Rock S. ½ W., nearly 3 miles; the buoy on Nye's Ledge S. by E. ¾ E., 2¼ miles; the buoy on the S.E. point of Mattapoiset Ledge S. ¾ E., 1¾ miles; the buoy on the N.W. part of Mattapoiset Ledge S. ¼ W., about 1½ mile; and the buoy on the Snow Rock S. by E., nearly ⅝ of a mile.

Mattapoiset is said to be a good harbour for small vessels, and easy of access. When bound for this place, before coming up with West Island, bring Bird Island Light to bear N.E. by N., and run for it until the light on Ned's Point bears N.N.W. ½ W., when you may haul up N.W. by N. In running this course, you will pass a white buoy with two black stripes on it, lying on the middle of Nye's Ledge in 2½ fathoms; this ledge is a quarter of a mile across, has not more than 8 feet on some parts of it, and must be left on the port hand. Sailing on in this course, a black buoy will be passed also on the port hand; this lies on the S.E. part of Mattapoiset Ledge, in 2½ fathoms. You will next pass two buoys, one on your starboard hand, and the other on your port side; the latter on the east side of the Sinking Ledge, in 3 fathoms, and the former on the side of the Snow Rock, in 2½ fathoms. Over the Snow Rock are 8½ feet. Keep mid-way between them, and when Ned's Point Light bears East you may anchor in 2 or 2½ fathoms water, good bottom.

Besides these buoys are two others: one is moored about N.E. from the Snow Rock in 3 fathoms, by the side of Barstow Rock; the other on the extremity of Ned's Point, in 2 fathoms.

SIPPICAN HARBOUR, 3 miles north-eastward of Mattapoiset, has its entrance between Charles' Neck and Bobell Rock on the western, and Sippican Neck and Bird Island on the eastern side. It thence runs in N. by W. ¾ W., 3 miles, the deepest water, 13 to 21 feet, first being found along the eastern, and afterwards along the western shore, passing on the west side of a small island lying nearly in mid-channel, up to Sippican, where are from 7 to 10 feet. Bird Island is small, only 5 or 6 feet above the level of the sea, and has upon it a lighthouse, which is 29 feet high, and shows a light revolving every 1½ minute, at the height of 35 feet, visible to the distance of 10 miles. From the north entrance of Quick's Hole this light bears N.W. by N., 14 miles, and from the north entrance of Wood's Hole N. ¼ E., 9 miles. To run up to Sippican, a stranger should obtain the aid of a pilot.

WAREHAM.—The entrance of Wareham River is 3½ miles northward of Bird

Island, and in the north-west corner of the head of Buzzard's Bay. The town is about 2 miles within the river, but only small vessels ascend to it under the guidance of local knowledge, there being but 9 and 6 feet, and perhaps less, water in the channel at low tide. The harbour should only be attempted in the daytime, when you pass up leaving the black buoys on the port hand and the red ones on the starboard.

SANDWICH HARBOUR.—The little and shallow harbours of Back River, Monumet River, and Cohasset are frequented by small vessels only, and these go in under the pilotage of persons acquainted with the navigation. They are situated in the north-east corner of the head of Buzzard's Bay, and the deepest channel to them lies almost close along the northern shore of Wing's or Wenaumet Neck, nearly up to Toby's Island, where the depths are from 2 to 3¼ fathoms. Going into Back River Harbour by the channel between Toby's and Marshne Islands, it should be remembered that from the former a ridge of shoal water extends over towards the latter, whereon are only 6 to 9 feet. Having passed over this ridge, you will have from 15 to 20 feet water, which depth you will maintain for a short distance, and then come up with a ridge of hard sand above a cable's length broad, also with only 6 or 9 feet water over it; after this is passed there will be from 3 to 3½ fathoms quite up to the harbour's mouth. Bound to Monumet or Cohasset Harbour, the best water, as before stated, runs along the northern side of Wing's Neck till nearly up with Toby's Island, and then turns to the northward towards Tempes Knob Point, and afterwards to the north-eastward, passing on the western side of Marshne and Hog Islands. Northward of the latter island the water gradually shoalens from 12 feet as you approach either harbour.

The fixed light on the extremity of Wing's Neck has been described on page 118.

On the *eastern shore* of Buzzard's Bay, proceeding from Wing's Neck southward, are the harbours of Red Brook, between Wing's Neck and Scraggy Neck; Cataumut, immediately southward of Scraggy Neck; Wild Harbour, separated from the former only by a small peninsula; Hog Island Harbour, nearly 2 miles further southward; Quamquisset Harbour, 4 miles southward of Hog Island Harbour: all capable of accommodating the small coasting craft which frequent the neighbourhood. The shore of Scraggy Neck, and also that about Hog Island Harbour, and between it and Quamquisset, should have a wide berth given it, if not bound to one of these places, because there are several very shallow spits and some detached rocks extending from and lying off it, in some places, to and at the distance of one mile, or nearly so. Wood's Hole, between Naushon Island and the main, has been described on page 116.

Wepecket Island, &c.—When making for the northern entrance of Wood's Hole, be careful to avoid the shoal ground around Wepecket Island, and the rocks north-eastward of it. The island is small and lies about ⅓ of a mile off Naushon, being separated therefrom by a narrow but deep channel, and 8½ miles nearly E.S.E. from Dumpling lighthouse, on the opposite side of the bay. About ½ a mile north-eastward from the island there is a spot of 6 feet water, connected to the shoal which surrounds the island by depths of from 9 to 12 feet. And at 1¼ mile from it in the same direction lies a small rock, named the Wepecket Rock, which has but one foot of water over it, and is steep-to on all sides; it is marked by a buoy striped horizontally, and may, therefore, be passed on either side at a moderate berth.

WESTPORT.—Between the Hen and Chickens and Saughkonnet Point, the coast forms a curve, at the head of which is the entrance to Westport, a place of but little importance, and frequented only by small vessels under the charge of local experience. In the bay thus formed are several rocky heads, the positions of which can be best understood by reference to the chart, but as they lie at a good distance from the shore, large vessels in particular should carefully avoid getting to the northward of an imaginary line joining the Hen and Chickens and the rocks off Saughkonnet Point. We believe the authorities have authorized the erection of a lighthouse on the Point of Rocks, on the west side of the entrance to Westport.

SAUGHKONNET RIVER.—The entrance to this river is between Saughkonnet Point and Sachuest Point, on Rhode Island, the course and distance to it from a position about a mile south-westward of No Man's Land is N.W. 22 miles, and from a similar position off the south-east end of Block Island N.E. 23 miles. A shoal flat extends ½ a mile south-westward of Saughkonnet Point, upon which are several large rocks always above water, and ¾ of a mile S. by W. from Sachuest Point lies the Cormorant Rock with 6 and 7 fathoms close-to all round; but there is a shallow bank of 3 and 4 fathoms ½ a mile westward of it. To avoid these dangers shape a course mid-

way between the two points, steering N. by E. Keep near the middle of the river, and the depth will gradually decrease from 10 to 8, 6, 4, and 3 fathoms as you advance upwards. When about 3 miles within its mouth you may anchor in 4 or 5 fathoms abreast Gray's Landing, or you may proceed 3½ miles further to just above Fogland Point and bring-to in a similar depth opposite Corey's Wharf. Fogland Point projects nearly half-channel over towards the western or Rhode Island shore, and thus reduces the width of the river to ⅔ of a mile. From this latter anchorage there is water communication with Fall River, and Taunton, and round the north end of Rhode Island with Bristol, Providence, Pautuxet, Warwick, Greenwich, Wickford, or Newport.

NEWPORT, or RHODE ISLAND HARBOUR, has its entrance 6 miles westward of Saughkonnet River, and 7 miles N.E. ¾ E. from Point Judith, between Brenton's Reef and Beaver Tail, which are 1¾ mile apart, the intervening depths ranging from 10 to 20 fathoms. Thence the channel runs in 3 miles north-eastward to abreast the town of Newport, and is nowhere less than ½ a mile in width, nor under 10 fathoms in depth. Fronting the town and separated from it by a narrow passage only ¼ of a mile wide and from 12 to 21 feet deep, is an elongated island, named Goat Island, having a shoal spit* extending from each end, the extremities of which are marked by buoys, and a battery near its centre. On a projecting point on the southern shore of the harbour is Fort Adams, midway between which and Goat Island good anchorage may be had in from 5 to 7 fathoms, soft bottom. Rose Island, with its battery, is situated near the middle of the harbour, and has shoal water extending a considerable distance from its eastern and northern sides. North-eastward of Rose Island is Coaster's Harbour Island, with the Gull Rocks between; on each side of these rocks there is a channel 150 fathoms wide and 5 and 7 fathoms deep, and anchorage in 4 or 6 fathoms can be had between them and the town, the best passage to which is between Rose and Goat Islands. Abreast the ferry on the western or Conanicut shore of the harbour there is likewise good anchorage in from 5 to 9 fathoms, soft bottom. The best anchorage, however, is within and nearer to the Goat Island side than to that of Rhode Island, as the other parts of the harbour are grassy, and, therefore, apt to choke the anchors.

High water takes place here at 7h. 45m. on the days of full and change of the moon; spring tides rise 4½, and neaps 3 feet. The duration of the flood averages 6h. 21m., and that of the ebb 6h. 3m., reckoned from the middle of the stand at low water to the middle of the stand at high water; the mean duration of the stand, or still water, is 23 minutes.

Brenton's Reef and Lightvessel.—Brenton's Reef extends ⅝ of a mile S.S.W.-ward from the eastern point of entrance of Newport Harbour, and shows itself by breakers with even a slight motion of the sea; some portions of it are bare at low water. Its south-west extreme is marked by a buoy, which must be left on the starboard hand going in. The Seal Rocks are ½ a mile eastward of Brenton's Reef, but do not extend so far from the land. Brenton's Reef Lightvessel is moored in 13 fathoms, about ½ a mile S.S.W. from the reef, with Point Judith lighthouse S.W. by W. ¼ W.; Beaver Tail N.W.; and Castle Hill Point N. by E. The vessel is of a straw colour, with "Brenton's Reef" painted on each quarter, and shows two fixed lights at the height of 40 and 50 feet above the level of the sea, visible 12 miles. A fog-bell and fog-horn are sounded during thick weather every alternate five minutes.

Beaver Tail forms the south point of Conanicut Island, and the west point of entrance of Newport Harbour, and has a lighthouse upon it consisting of a square granite tower 49 feet high, attached to the south-east angle of the keeper's dwelling, and exhibiting a fixed light 82 feet above the level of the sea, visible 14 miles. To warn vessels of their position a whistle is blown during foggy weather. About 300 yards S.S.W. from the lighthouse is a sunken rock, named the *Newtown*, which becomes awash, and, causes the sea to break over it with any swell, and is marked by a buoy moored in 5 fathoms off its southern side.

On one of the *Lime Rocks*, near the south shore of the harbour, opposite the south end of Goat Island, there is a small fixed light, 30 feet high, and visible to the distance of 11 miles in clear weather. It serves as a guide to vessels proceeding to the wharves of the town through the channel between the Lime Rocks and the buoy on the edge of the spit extending from the south end of Goat Island, wherein are from 12 to 18 feet water.

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* A breakwater has been constructed upon the northernmost spit; it runs parallel to the shore of Newport, and affords protection to vessels lying between it and the town.

On the north end of the *breakwater*, extending northward from Goat Island, is also a small fixed light, about 33 feet high, and visible 11 miles.

Besides the foregoing, there are the following spindles and buoys in Newport Harbour:—A spindle with a ball, on a rock on the south end of Rose Island, which must be left to the northward; a spindle on Saddle Rock, south-eastward of Rose Island, which may be passed on either side; a buoy on the north-east extreme of the shoal running off from the north end of Rose Island; one buoy on the south and another on the north end of the Gull Rocks; a buoy with a cross, on Dyer's Reef, off south part of Coaster's Harbour Island, which must be left on the eastern side; and a buoy on the Triangle Rock, lying off the Bishop's Rock, which may be passed on either hand.

DIRECTIONS.—If from the south-eastward, and having made No Man's Land, bring it to bear N.E. 2 miles, and steer N.W. by W. 26 miles, the entrance of Newport will then be distant $2\frac{1}{2}$ or 3 miles in a northerly direction. Or, if from Vineyard Sound, leave the Sow and Pigs lightvessel about a mile off on your starboard side, and steer W. by N. $\frac{1}{2}$ N. 18 miles, which will bring you to a similar position off the harbour's entrance. With light winds and a flood tide an allowance in each of these courses must be made for the set of the stream into Buzzard's Bay and Saughkonnet River, in order to guard against being carried on to the rocks in and about Westport Bay, or on to the Sow and Pigs.

From a position one mile off the S.E. point of Block Island to Beaver Tail lighthouse, the course and distance are N.N.E. $\frac{1}{2}$ E., $18\frac{1}{2}$ miles; about midway between them are 24 fathoms water. From the southward and westward, bring Montauk light to bear N. by W. $\frac{3}{4}$ W., distant about $1\frac{3}{4}$ mile, and, if intending to pass on the western side of Block Island, steer N.E. $\frac{1}{4}$ E. for 24 miles, when Point Judith will bear about N. by E., nearly $1\frac{1}{4}$ mile distant, and you will be in about 7 fathoms, grey sand and gravelly bottom. In this course be careful to give the shoal which runs a long mile northward from the north point of Block Island, a good berth on your starboard hand. From off Point Judith steer N.E. $\frac{1}{2}$ N. towards Beaver Tail lighthouse.

Going in keep to the southward and westward of Brenton's Reef lightvessel. Should the lightship at any time be driven from its moorings, then when coming from the eastward, to clear the reef, bring Beaver Tail lighthouse to bear N.W. by W., and run for it until Goat Island light can be seen from the deck; the latter will then bear about N.E. $\frac{1}{2}$ E. Give Beaver Tail light a good berth to avoid the Newtown Rock, and shape a course N.E. up the harbour, keeping as near mid-channel as possible to avoid all fear of touching on the rocks under Castle Hill Point on the eastern, and the Kettle Bottom Rock on the western side of the harbour. When Goat Island light bears N E. by E. steer towards it, leaving the Dumpling Rocks on the port hand, and the shoal ground around Fort Adams on the starboard, and anchor where convenient.

BRISTOL, &c.—Bristol Harbour is 10 miles north-eastward of Newport, the channel to it from the latter harbour being between Rhode and Prudence Islands, but to go up to it the aid of a pilot is needed by a stranger. On Sandy Point, on the western side of the channel, and on the eastern shore of Prudence Island, there is a white building, from which a small fixed light is exhibited at a height of 30 feet, visible about 10 miles. Fronting Bristol Harbour are two islands, the northernmost, or Castle Island, having a pyramid upon it. On Bristol Ferry Point, the eastern point of the harbour, there is another small fixed light, shown from the top of the keeper's dwelling, at an altitude of 35 feet, and visible to the distance of 10 miles; this light is intended as a guide to vessels proceeding north-eastward up to Fall River or Taunton, and must be left on the port, and the beacon on the opposite, or north end of Rhode Island, on the starboard hand.

PROVIDENCE RIVER.—From Newport Harbour there are two passages to Providence River, one on the eastern side of Prudence and Patience Island, and the other on their western side, between the latter island and Warwick Neck. The usual course is, having quitted Newport Harbour either by the channel westward of Rose Island, or by one of those between it and Coaster's Harbour Island, to leave the buoy on the Triangle Rock on the starboard hand, and steer towards the spindle on Half-way Rock, which may be passed on either side. In this course, give the shore of Gould Island a good berth, and when steering towards Hope Island give the north point of Conanicut Island also a good berth. Hope Island lies nearly in the middle of the channel between Prudence Island and the western mainland, and has a good passage on either side; give its north-east end a small berth. You now shape a course towards Warwick Neck, whereon there is a tower, attached to the south end of the keeper's house, from which a fixed light is shown at the height of 54 feet above the level of the sea, visible 14 miles.

South-westward of Warwick Neck light you will perceive a beacon, erected upon a rock situated in about mid-channel, which can be passed on either side, hauling up westward into Greenwich Bay, or northward into Warwick Harbour.

Bound to Providence River, leave Warwick Neck to port, steering between it and Patience Island, and when the light bears West, steer towards Nayat Point, on the eastern side of entrance to Providence River. Upon Nayat Point a white square brick tower 31 feet high has been erected, from which a fixed light is exhibited at an elevation of 45 feet, visible 11 or 12 miles; a rocky shoal extends southward and westward about 200 yards from the point. Nearly opposite Nayat Point is Connimicut Point with its sandspit and beacon.* In sailing from Warwick light towards Nayat Point, you leave the buoy on Providence Point, the north Point of Prudence Island, on the starboard hand, and run so far to the eastward as to bring Prudence Island to bear South, by which you leave the Middle Ground, marked by a buoy, on the port hand. Soon after passing Nayat Light, you arrive at a pyramid directly opposite to the village of Pautuxet, the base of which is painted black, with a white top; this is erected on a ledge of rocks which can be approached very closely, leaving it on the port side. At a short distance from this is another pyramid, and a stake, which you are to leave on the port hand. The Lovely Rocks lie a quarter of a mile from the last pyramid. They are marked by a buoy, and must be passed closely on the starboard hand.

Vessels sometimes anchor about $\frac{1}{4}$ of a mile eastward of Warwick Neck light, in 3 fathoms water, for it is not safe to proceed further without a pilot, unless you think proper to run the risk of finding out the channel, which is marked by stakes.

According to the harbour regulations of the port of Providence, all vessels approaching the harbour other than at high tide, if drawing over 8 feet water, are obliged to anchor below the Crook, until the tide shall have risen sufficiently to enable them to reach the wharves. July 4, 1853.

NARRAGANSETT BAY has its entrance on the western side of Beaver Tail lighthouse, between it and Boston Neck. It then runs in northward between Conanicut Island and the main, towards Wickford, Warwick, Providence, &c., and has a depth of from 5 to 12 fathoms. Dutch Island is about 3 miles within its entrance, and has a passage on either side, but that on the western is the widest, though on the eastern side good anchorage may be had off the middle of the island in 4 or 5 fathoms, on a soft bottom; this place is named Dutch Island Harbour. The south point of Dutch Island has upon it a dwelling house and tower, built of brick, and both whitewashed; the base of the tower is $20\frac{1}{2}$, and the centre of the light, which is a fixed one, 56 feet above mean low water; in ordinary weather the light can be seen at a distance of 14 miles.

When running for Narragansett Bay, proceed as already directed for making Beaver Tail lighthouse when bound for Newport, page 124. Give the lighthouse a good berth on your starboard hand to clear the Newtown Rock, and keep along at a moderate distance off the Conanicut Island shore, so as to avoid the Whale Rock and Jones' Ledge, both of which are steep-to all round, and lie off the western or mainland shore, the former at the distance of 400 fathoms, with Beaver Tail lighthouse bearing E. $\frac{1}{2}$ N., $1\frac{1}{2}$ mile, and the latter, on which are only 6 or 7 feet, about 350 fathoms from Watson's Pier, and N.W. 1 mile from the lighthouse. Anchorage may be had wherever convenient, but if intending to go into Dutch Island Harbour, run up till within $\frac{1}{2}$ a mile of the lighthouse on the south point of that island, and then haul in north-eastward, keeping at from 1 to 2 cables' lengths from its eastern side, as a flat runs off above $\frac{1}{2}$ of a mile from the shore of Conanicut Island.

WICKFORD is a small harbour on the western side of Narragansett Bay, opposite the north end of Conanicut Island, and 5 miles within Dutch Island lighthouse. On Poplar Point, the south point of entrance, a fixed light is shown from the top of the keeper's dwelling; it is 51 feet above the level of the sea, and visible to the distance of 12 miles. In sailing towards Wickford the widest channel is on the west side of Dutch Island; thence you may pass on either side of Fox Island up to Poplar Point. Although the rocks and shoals in the bay and off the harbour's entrance are marked by buoys or spindles, still it would be safer to employ a pilot.

* This is a beacon light. The beacon consists of wood, square in shape, and painted white, with a spindle and vane on its summit pointing to the direction of the channel. It is, however, liable to be swept away by the ice, as was the case in the early part of 1860; at such times vessels will do well to give the point a wide berth.

POINT JUDITH is said to appear like a nag's head, making rather bold. It may be further distinguished by a white stone building, 46 feet high, on which is a lantern 67 feet above the level of the sea, showing a light revolving every 15″; it cannot, therefore, be mistaken for that on Conanicut Island. Between this point and Block Island there are from 5 to 24 fathoms.

BLOCK ISLAND lies nearly in the middle of the entrance to Long Island Sound, and is about 5 miles long from north to south, and 3 miles broad at the southern end, whence to the northern extremity of the island it tapers to a point. It is of moderate height, and has a white lighthouse, with keeper's dwelling attached, upon its northern extremity, which shows a fixed light at 60½ feet above the sea, visible 13 miles. Between the bearings, from the light, of E. 35° S., by the south, and S. 25° W., it is hidden by the elevated parts of the island, but it may be seen in all other directions.

A depth of 6 and 7 fathoms will be found at a short distance off all round the island, except at its northern extremity, where a shoal runs off about a mile to the northward, which has 7 to 10 feet upon it at low water, and 5 to 10 fathoms close-to all round. To avoid this shoal, you should not approach the lighthouse nearer than a distance of 2 miles; other marks are,—Old Harbour Point open of Clay Head (the projecting points on the east side of the island), to clear its eastern side; or Point Judith Lighthouse nothing to the northward of N.E. to clear its western edge. This shoal is very dangerous to approach, as the tide sets across it with considerable strength.

At about 2⅓ miles to the south-westward of Block Island is the *South-west Ledge*, which is 1½ miles in length, in a N.E. and S.W. direction, and has on its shoalest part 5 fathoms, rocky bottom. Upon it in blowing weather from seaward the sea breaks heavily. The marks for it are the east point on the south side of the island just open with the middle point, and Block Island lighthouse N.E. ½ N.

Directions for approaching Block Island, &c.—In approaching the south shoal of Nantucket, the tide runs swiftly, but regularly, to the N.E. and S.W. Near this shoal to the southward, in 25 or 30 fathoms, there is a fine black and white sand; to the eastward, in the same depth, there is coarse sand, gravel, and shells. Near the shoal the water appears very light coloured, the bottom being of black and white sand, with green shells. Nine or ten leagues to the westward of this shoal, in 30 or 40 fathoms, there is a black mud of a shining smooth quality, and here lies the Tuckernuck Channel.

If, when coming from sea, you should fall into Block Island Channel, you will find from 54 to 70 fathoms, soft muddy bottom. It is most likely that you will first gain ground in latitude 40°, and in standing to the northward, may shoalen your water to 30 fathoms; thence, when in sight of Block Island, you will have from 25 to 20 fathoms, sandy bottom.

With Block Island bearing North, 4 or 5 leagues distant, you cannot see any land to the northward or eastward: but on approaching the island, you will see Montauk Point with its lighthouse, to the westward, making as a long low point.

In sailing to the W.S.W. you will make no remarkable land on Long Island, as its broken land appears at a distance like islands. You will have 20 or 22 fathoms out of sight of land, sandy bottom in some, and clay in other places.

The charts will be the best guide to soundings. To the southward of No Man's Island, there is coarse sand, like gravel stones, in 20 and 25 fathoms, and S.S.W. from it, in 28 or 30 fathoms, coarse red sand. S.S.E. from Block Island, in what is termed Block Island Channel, there are 30 and 40 fathoms, with oazy bottom; but, shoaling the water to 25 or 20 fathoms, you will find coarse sand.

In approaching the south side of Block Island, from the southward, the water shoalens gradually. When the island bears from N.W. to N. by W. the bottom is mud; this is commonly named Block Island Channel. This island appears high and round as you come from the southward; and, if from the S.E., it is like a saddle, low in the middle and high at each end, though highest to the southward.

LONG ISLAND SOUND.

Long Island Sound, the passage between Long Island and the state of Connecticut, from Block Island to Throg's Neck, is about 110 miles in length, and its greatest breadth, which is abreast of New Haven, 17 miles, its general direction being E. ½ N. and W. ½ S. It is throughout well lighted, and the principal dangers are marked by buoys and lightvessels, so that with careful attention to the set of the tides a safe and easy inland navigation to New York is afforded. There are several important places in the sound, among which may be mentioned Stonington, New London, Saybrook, New Haven, Bridgeport, &c., on the northern shore, and Sag Harbour, Greenport, Huntingdon, &c., on the southern; these, with the various dangers in the way of vessels sailing to or from them, are described in their proper order, but to those passing direct from the east to the west end of the sound, the following general observations will, perhaps, be all that is requisite; if they are not sufficient in detail, they will at least facilitate a reference to the more particular description.

COURSES UP THE SOUND TO NEW YORK.—Entering between Block Island and Point Judith, and being in 13 fathoms with the lighthouse on the latter bearing N.N.E. 3½ miles, the course and distance towards Gull Island fixed light are W. ½ S. 21 miles, then West 6 miles. In this course you will leave on your port hand the fixed light on the north extreme of Block Island, from which a reef extends above a mile to the N. ¼ E., with only 5 and 6 feet on its outer part, and deep water of 16 and 21 fathoms ¼ of a mile off its northern edge. When tacking towards the shore of Rhode Island, in the vicinity of Watch Hill Point, your depth should not be decreased beyond 18 fathoms, for at ⅔ of a mile from the point there is a dangerous reef, marked by a spindle, and thence to the East Point of Fisher's Island are several isolated rocks and shallow patches at even a greater distance from the land. Also in standing to the southward the position of the Middle Ground or *Cerberus Shoal* should be remembered; it lies with Watch Hill Point lighthouse N.E. ¾ N., 9 miles; Montauk Point light S.E. by S. ½ S., 7⅔ miles; and Gull Island light nearly W.N.W., 7 miles distant. The passage between the west end of Fisher's Island and little Gull Island is named the Race, on account of the velocity of the tides, which here attain a rate of 4 knots during the second and third quarters of both flood and ebb; when passing through, it is recommended to leave the light at from ½ to 1½ mile on your port hand, to avoid the *Valiant Rock*, which lies E.N.E. ¼ N. 2⅛ miles from the Gull light, and likewise the *Race Rock*, situated half a mile south-west of Race Point, the west end of Fisher's Island, which rock has an iron spindle upon it. We believe that a buoy is placed on or near the Cerberus Shoal, and another on the Valiant Rock. Having passed through the Race or Main Channel you will have fairly entered Long Island Sound.

Coming in between Block Island and Montauk Point, and when approaching the latter, the *Montauk shoal*, which breaks in heavy weather from seaward, and has 4 fathoms over it, should be avoided; its position is with Montauk light N. by W. distance 2⅔ miles. About 3 miles south-westward of the S.W. end of Block Island there is a rocky ledge over which the sea also breaks in heavy weather from seaward, but the depths upon it are not less than 5 and 6 fathoms. Being in 7 fathoms gravelly bottom with Montauk light S.W. by S. distant 2 miles, a N.W. ½ W. course for 13 miles will bring you up to Gull Island light, leaving the shallow flat extending ⅔ of a mile from the north side of Montauk Point, the *Washington shoal*, and the *Shagwong Reef*, the latter marked by an iron bell boat, on your port hand, and the *Cerberus Shoal*, mentioned in the previous paragraph, on your starboard side. The shoalest spot of the Washington Shoal, 12 feet, is with Montauk light 2⅓ miles distant on a S.E. ¼ E. bearing, and that of the Shagwong Reef with the same building S.E. ½ S., 3¾ miles; therefore, when tacking westward from the above N.W. ½ W. course, Montauk light should not be brought eastward of S.S.E. ½ E., as long as you are within 4½ miles from it. But if desirous of passing outside the Cerberus Shoal, then, from the foregoing position with Montauk light S.W. by S., 2 miles, steer with the ebb N.W. by N., or with the flood more northerly, for 7½ miles, and afterwards W. by N. ½ N., 6 miles towards Gull Island, when you may proceed as before directed.

With Gull Island light bearing South distant half a mile, the course and distance to where Falkner's Island flashing light bears North 5½ miles, are W. ½ S. 14½ miles. Upon this course, and when through the Race, you will see to the northward th *Part-*

lett Reef lightvessel, which is moored off the south end of that extensive reef, and shows two fixed lights. About 6 miles further westward is *Hatchett's Reef*, which is joined by a flat of 2½ fathoms to the sand extending nearly 2 miles southward from the mouth of Connecticut River. Still further westward is the commencement of the *Long Sand Shoal*, a narrow sand, with a lightvessel showing a fixed light moored in 7½ fathoms near the middle of its south side; it runs nearly parallel to the northern shore for a distance of 5 miles, with only 6, 9, and 15 feet over it, and as it lies upon the average 2½ miles therefrom, great caution is required to avoid it when standing towards that shore. These dangers are buoyed, so that with the assistance of the lightvessel and the fixed light on the west point of entrance of Connecticut River, vessels will be enabled with care to pass clear of them; the depth of 22 fathoms is sufficiently near to approach them in foggy weather. From the west end of Long Sand Shoal to Falkner's Island, a distance of 9½ miles, there is no outlying danger beyond 1½ mile from shore, except the rocks around Falkner's Island and *Kimberley's Reef*, which is small, has only 10 feet over it, and lies 3 miles from the coast, with Falkner's light about W. ¼ S., 1⅓ mile. The foregoing are the most prominent objects and dangers met with in tacking to the northward-from the before-mentioned (W. ½ S.) course; the first on the port hand is Plum Island, the northern shore of which should have a berth of at least half a mile to avoid a 9-feet rock lying off it; the light on the west end of this island revolves once in every 30 seconds. About halfway between Plum Island light and the fixed one on Horton's Point, 12 miles further westward, a shoal of 6 feet fronts the small bay between Terry's and Rocky points; a berth of about one mile should, therefore, be given to the land in its vicinity to go clear of it. Also, immediately westward of Horton Point, and thence to a considerable distance, a shoal extends from the land above a mile, which in some parts has but 3, 6, and 9 feet over it.

With Falkner's Island light bearing North 5½ miles the course and distance thence to the lightship on the south side of the Middle Ground, are W. ½ S., 21 miles. Leaving this track and beating towards the northern shore, a too near approach should not be made thereto, especially between Falkner's Island and New Haven fixed light, for at 5½ miles westward of the former are the *East Ledge*, *Brown's Reef*, &c., lying over 2 miles from the mainland, and westward of them is *Branford Reef* with a beacon upon it. The light on the east side of New Haven entrance is a fixed one, and that on Stratford Point, nearly 11 miles south-westward, revolves once in every 1½ minute. Likewise when approaching the Long Island shore, a berth of at least 2 miles should be given it, for in several places between Horton Point and the fixed light on Old Field Point shoal water of 6 and 12 feet extends off 1 and 1¾ miles. The Middle Ground lightvessel lies ⅛ of a mile south-west of the shallowest (2 feet) spot of that shoal, and exhibits two fixed lights.

From the south side of the Middle Ground or Stratford Point lightvessel steer W. ½ S. 18 miles, or from a berth 2½ miles South from Stratford Point steer W. by S. ½ S., about 19 miles, you will then have Lloyd's Point distant 2 miles on a southerly bearing. In this course the prominent dangers and objects on the Connecticut shore, when clear of the buoy on the north end of the Middle Ground, are, the shallow flat extending 1⅓ mile from the land immediately westward of Stratford lighthouse; the fixed red light at the entrance of Bridgeport; the fixed light on Fairweather Island, at the entrance to Black Rock Harbour; the *Fairfield Bar* or *Penfield's Reef*, and the shallows surrounding Pine Creek Point, the former of which extends south-eastward 1⅓ mile from Shoal Point, and has a beacon and buoys near its outer edge, which may be avoided by not bringing Stratford Point light to bear anything eastward of E.N.E. while within 8 miles from it; the shoals and rocks fronting the Norwalk Islands to the distance of nearly 1½ mile off the easternmost of the group; and the revolving red and white light on Sheffield Island, the westernmost of the Norwalk Isles. *Budd's Reef*, a small spot of 4 fathoms, lies 1¾ mile S.W. ¾ S. from Sheffield Island light; this, and the reef running about the same distance westward from the said light, will require care to avoid when nearing the coast hereabout. On the southern shore, westward of Old Field Point, there is nothing in the way of vessels if a berth of 1½ mile be given to the land, until abreast the fixed light on Eaton's Neck, where, besides the shoal extending nearly a mile from the lighthouse point, the extremity of which has a buoy off it, there is a small rocky patch of 19 feet, also marked by a buoy, lying at 1½ mile N. by W. ¼ W. from the light, with deep water close-to all round. Lloyd's Point, the next westward of Eaton's, should likewise have a berth of at least ¼ of a mile.

With Lloyd's Point South distant 2 miles, the course and distance towards the fixed

light on Execution Rocks are W.S.W. 12 miles, passing on your starboard hand the Cow Rocks lying nearly a mile off Shippan's Point, and the fixed light on Great Captain's Island; and on your port hand the *Centre Island Reef*, running one mile off from the point next westward of Lloyd's, and the shoals off Oak Neck, Matinicock, and Prospect Points.

The Execution Rocks occupy a position in the fairway of the Sound, and must be left on the starboard hand, and a S.W. course for $3\frac{3}{4}$ miles steered, which will bring you up to the south end of City Island, passing Hart Island, the south point of which has 5 fathoms at a short distance off, on its eastern side; and leaving on your port hand the *Old Hen* and the broad flat which runs off above half a mile from the shore immediately eastward of Sand's Point, the revolving light on Sand's Point, the shallows off the said lighthouse, the *Gangway Rock* buoy, and the buoy on the edge of the *Stepping Stones*.

From the south end of City Island keep in mid-channel, steering S. by W. till up with Throg's Point fixed light, at the eastern entrance to the East River. Hence through Hell Gate to New York a vessel should preserve the middle of the river, passing northward of the Two Brothers, round northward and westward of Table or Great Mill Rock in Hell Gate, and through the channel east or west of Blackwell's Island, according to circumstances. The confined nature of the channel, together with the influence of winds and tides, all the way from the Execution Rocks to New York, make it advisable at all times to employ a pilot.

TIDES.—Between Block Island and Point Judith high water takes place on the full and change of the moon at 7h. 34m.; springs rise $3\frac{1}{2}$ and neaps $2\frac{1}{4}$ feet; and the average duration of the flood is 6h. 18m., that of the ebb being 6h. 6m. Hereabout, during the first quarter of the flood, the direction of the stream by compass is N. $\frac{1}{2}$ W. and the rate 1 mile per hour; during the second, about N.N.W. $1\frac{3}{4}$ mile; in the third W. by S. 1 mile; and during the last quarter, S.W. by W. about $\frac{1}{2}$ a mile an hour: the first and last quarters of the ebb run about E. by N., the second and third E. $\frac{3}{4}$ N. and W. $\frac{3}{4}$ S. respectively; the greatest velocity, during the second quarter, is $2\frac{1}{2}$ miles, and the least, during the last quarter, $\frac{3}{4}$ of a mile an hour.

Between Block Island and Montauk Point it is high water at 7h. 58m.; springs rise $2\frac{3}{4}$, and neaps $1\frac{3}{4}$ feet; the mean duration of the flood is 6h. 20m., and of the ebb 6h. 5m. The direction of the flood varies from W.N.W. $\frac{1}{4}$ N. at its early part, to N.W. by N. near its termination, and that of the ebb from E. by N. at its commencement to about S.E. by S. at the latter part. The velocity of the former ranges between $\frac{1}{2}$ a mile an hour in the first quarter, to $1\frac{1}{2}$ in the third; the rate of the ebb is greatest during the second quarter, when it attains to $1\frac{9}{10}$ mile, and least during the last quarter, at which time it does not exceed $\frac{3}{4}$ of a mile an hour.

In the Race, between Little Gull Island and Fisher's Island, it is high water at 9h. 38m.; springs range $2\frac{3}{4}$, and neaps $2\frac{1}{4}$ feet. The flood or in-going stream continues for about 6 hours, and the ebb for 6h. 20m., the former having a mean direction of about N.W. by W., with a velocity of from $1\frac{7}{10}$ on the last, to $3\frac{9}{10}$ miles per hour upon the second quarter; and the latter S.E. by E. $\frac{1}{2}$ E., between $1\frac{6}{10}$ and 4 miles an hour, attaining its greatest rate during the third quarter.

In the fairway of the Sound the direction of both flood and ebb is nearly that of the sound itself, namely, W. $\frac{1}{2}$ S. and E. $\frac{1}{2}$ N. till nearly up with Lloyd's Neck, and then W.S.W. and E.N.E. to the Execution Rocks; hence to City Island about S.W. $\frac{1}{2}$ S. and N.E. $\frac{1}{2}$ N., and from City Island to Throg's Neck S. by W. and N. by E. But as you approach the islands and shoals near either shore, their direction is of course varied according to circumstances, and strangers should, therefore, not attempt the channels in and among them without the aid of local knowledge. The velocity of the flood is greatest between the Race and Long Sand Shoal, where it attains to a rate of from $1\frac{1}{2}$ to 2 miles an hour; thence westward it gradually decreases till near the Execution Rocks, where it does not exceed 1 mile, and at Throg's Neck it meets with the stream out of the East River, and an almost perfect stagnation is produced. High water takes place at Throg's Neck at $1\frac{1}{4}$ hours later than at Little Gull Island, that is at 11h. 20m., which is about 3 hours after high water in New York Bay; springs range 9ft. 2in., neaps 6 feet. The ebb tide increases its speed from about 1 mile an hour near the Execution Rocks to 2 miles between the Middle Ground and the southern shore, then decreases through the broad part of the sound, and again increases to 2 miles and upwards as you near the Long Sand Shoal and the Race.

Prof. A. D. Bache, the able superintendent of the United States' Coast Survey, says,

"Between Throg's Point and Fisher's Island there is a difference of time in the tides and tidal currents of 2h. 20m., the greatest part of which is at the head of the sound and at its entrance, that is, near Throg's Point and Fisher's Island. From off New London to off Sand's Point, the difference is but 1h. 40m.; so that if the mariner, instead of remaining at Throg's Point, passes onward to Fisher's Island, he would lose but half a tide in the whole passage. In other words, he would have the same succession of rise and fall, according to the time elapsed, whether stationary or passing onward, within 2½ hours, or less than half a tide. The tidal current lines show that even a less allowance is to be made for the change of current than for the change of tide, the difference in the change of current between Throg's Point and Fisher's Island along the middle of the sound being of no practical importance. Passing out of Long Island Sound, the tidal hours grow earlier, until off Block Island, where it is the same as that off Sandy Hook."

NORTH SIDE OF THE SOUND.

The revolving light on Point Judith has been mentioned on page 126. Westward of the point, and separated from it by soundings of 4 and 5 fathoms, is *Squid's Ledge*, a narrow rocky shoal, extending ¾ of a mile in a N. ½ W. and S. ½ E. direction, with 13 feet at each end, the southern being 1½ mile West from Point Judith Lighthouse, and the northern end ½ a mile from the shore, between which the depth is 3¼ fathoms. To clear it on the south side, do not bring Point Judith Light eastward of E. by N. Hence to Watch Hill Point, at the entrance to Fisher's Island Sound, the coast trends W. ½ S. 18 miles, and consists of a low sandy beach, enclosing several lakes or ponds, which have communication with the sea by means of very narrow and shallow outlets; there is, however, no outlying danger, and a depth of 3, 4, and 5 fathoms will be found ¼ of a mile off the land, so that at night time or in thick weather soundings of 10 and 12 fathoms and upwards should be maintained.

FISHER'S ISLAND SOUND.—The channel between Fisher's Island and the main affords a passage to a vessel under the guidance of local knowledge, and which does not require a greater depth of water than 3 fathoms. It is about 8 miles in length, but the fairway or main channel through it is not over ⅜ of a mile in width where narrowest, though the Sound itself has an average breadth of 1¾ mile. In it there are a great number of rocks and shoals above and under water, a correct knowledge of the positions of which can only be obtained by a reference to the chart, the result of the survey made by the officers of the United States Navy. Upon several of the most dangerous reefs there are spindles or buoys to mark their situation, but there are many dangers which are not so marked, hence great caution must be taken in proceeding through, or to Pawcatuck River, Stonington, Portersville on the Mystic River, West Harbour, or any other place in it.

Tides.—At Watch Hill Point it is high water on the days of full and change at 9h.; springs range 3 feet, and neaps 2⅓; the average duration of the flood is about 6h. 35m., and that of the ebb 5h. 56m. The stream of flood comes in from the eastward, and continues through the sound with a velocity not exceeding 1⅓ mile per hour, and the ebb the contrary, its greatest rate being about 1⅓ mile an hour.

Lights.—On Watch Hill Point at the eastern entrance of Fisher's Island Sound, there is a fixed light shown at the height of 62 feet above the mean level of the sea, from a granite tower 40 feet high, standing at the south-east corner of the keeper's dwelling, which latter is built of brick and whitewashed; in ordinary states of the atmosphere the light can be seen at the distance of 12⅓ miles. Within the sound, on the northern shore, and on the south end of the promontory which forms the eastern side of the harbour, and whereon is built the town of Stonington, is a white building serving as the keeper's dwelling, from the top of which, at the height of 50 feet, a fixed light is exhibited, visible to the distance of 12 miles. About 4 miles W. by N. from Watch Hill Point, nearly 2¼ miles W.S.W. from Stonington Light, and on the south side of Eelgrass Ground, is a lightvessel moored in 4 fathoms, which shows a fixed light at an elevation of 32 feet, visible 10 miles in clear weather; a bell is rung and a horn sounded in foggy weather every alternate 5 minutes; the main ship channel is southward of it. Morgan's Point lighthouse, on the northern shore of the sound, and on the west side of entrance to Mystic River, is 34 feet high and coloured white; its light, a fixed one, may be seen about 11 miles off, being shown at the height of 44

feet. The light on the North Dumpling, an islet in the western entrance to the sound, W. by S. 3½ miles from Eelgrass Lightvessel, is a red fixed light 70 feet high, exhibited from a white tower 25 feet high, and is, therefore, visible at a distance of 12 miles; a bell is rung in foggy weather.

Directions.—At the eastern entrance to Fisher's Island Sound a chain of isolated reefs, with from 3 to 6 fathoms between, forms a kind of curve from the east point of Fisher's Island to Watch Hill Point. There are many channels through it, but the three principal are the Watch Hill Point, Lord's, and East Point Channels. When approaching, therefore, great caution should be exercised, particularly as the tide sets over the rocks with considerable strength. If to the eastward of Watch Hill Point and bound *through* the sound, steer so as to give the point a berth of 2 cables' lengths to avoid the Gangway Rock and buoy; you will thus leave the spindle on Watch Hill Reef 3 or 4 cables on the port hand; a W. ¾ N. course should now be followed, giving the next point to Watch Hill, namely Napatree Point, a berth of 3 cables on your starboard side, in case the buoy marking the reef running from it should be driven from its position; as you proceed on this course the two spindles marking the rocks on each side of Lord's Channel will be left to port, and that on Latimer's Reef* should have a berth of ¼ of a mile on your starboard hand. When nearly abreast Latimer's Reef, you will have on the opposite side of the channel the Wicopesset Reef, Seal, and Young's Rocks, consequently you should not approach the shore of Fisher's Island hereabout nearer than 3½ or 4 cables, though, we believe, Young's Rock, has a buoy off it. Continue on the above (W. ¾ N.) course, leaving East Clump Islet on the port, and the buoy and spindle on Ellis' Reef on the starboard side. As soon as Ellis' spindle, which is about 1¼ mile westward of Eelgrass Lightvessel, bears North, distant 3½ cables' lengths, steer W. ¾ S., passing on the north side of Dumpling Lighthouse;† this will carry you out to the lightvessel off the south end of Bartlett's Reef, and a fresh course can then be shaped up Long Island Sound. But if bound to New London continue as before—that is, W. ¾ N., and you will probably pass over an 18 feet hard spot, just before you come abreast of Groton Long Point; give this point and the buoy on the edge of the off-lay from it a good berth, and also the point next westward of it, off which there is a rock, with only 1 foot over it, at the distance of 2 cables' lengths. When the spindle on Seaflower Reef‡ bears S.W. by W., and the North and South Hammocks or Dumplings are in range, the first will be distant 4 cables' lengths, and the buoy on the Horse Shoe Reef§ will be a similar distance off on your starboard side; from this position the New London Lighthouse will appear just open north of Smith's House N.W. by W. ½ W., a course that when followed will lead up to the former through Pine Island Channel.

In following these directions notice, that between Watch Hill Point and Latimer's Reef, the last of the tide sets across the reefs which lie between Watch Hill Point and the east end of Fisher's Island. This set, on the ebb particularly, must be allowed for. On the flood it is not so strong.

Lord's Channel, on the eastern side of Wicopesset Islet, should not be attempted by a stranger, unless the leading mark, namely, Stonington Lighthouse, open a sail's breadth to the eastward of the hotel in the northern part of the town,‖ can be clearly distinguished. When such is the case follow that direction, passing between the two spindles, giving the eastern one a berth of 1½ cable's length, and when Watch Hill Point Lighthouse bears E. ¼ S. haul up W. ¾ N., and proceed as before directed.

East Point Channel, between Wicopesset Islet and Fisher's Island east point, is likewise not recommendable to a stranger; in it there are only from 15 to 18 feet water. The leading mark is Latimer's spindle in line with the centre and highest part of a

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* A rock lies ¼ of a mile E. by S. from Latimer's Spindle, with only 3 feet upon it, which is marked by a buoy on its eastern side.

† The North Dumpling is bold-to, except on the east side, where a shoal extends from it a cable's length.

‡ Seaflower Reef lies ¾ of a mile N.W. from North Dumpling Lighthouse, and being but of small extent, may be cleared on either side by giving the spindle a berth of 2 cables.

§ The Horse Shoe Reef, nearly awash at low water, is 1⅛ mile N. ¼ W. of North Dumpling light, and about ¾ of a mile N.E. by N. from Seaflower Reef.

‖ The hotel is a large white building with a cupola.

wood on Mason's Island, bearing about N.W. ¾ N.; this leads over or very near a sunken rock of 4 feet, which has a buoy on it to be left on the port hand going in. Having followed this line of direction till within 3½ cables of the spindle, steer W. ¾ N. as before.

Coming in from the *westward*, when the lightvessel off Bartlett's Reef bears North, distant nearly ½ a mile, steer E. ¾ N., and pass almost close-to on the north side of North Dumpling Lighthouse up to where the spindle on Ellis' Reef bears North, distant 3½ cables' lengths. An E. ¾ S. course will then lead out between Watch Hill Point and Reef, and by reversing the foregoing directions for passing through from the eastward, a vessel will be enabled to get out by one or other of the channels clear of the reefs at the eastern entrance of Fisher's Island Sound.

Fisher's Island Sound is perfectly safe with these instructions, and is to be preferred, if bound to the eastward on the flood or westward with an ebb tide, to going through the Race, or to the south of Fisher's Island; but it should not be attempted by strangers without a leading wind, and great attention should be paid to the lead. The assistance of a pilot is of course advisable.

Little Narragansett Bay, in the extreme eastern part of Fisher's Island Sound, is formed by the narrow tongue of low land running first westward from Watch Hill Point, and afterwards northward towards Stonington, but being occupied for the greater part of its area by a flat of hard sand, with only 2, 3, and 4 feet water upon it, none but the smallest craft can enter or pass through it and up the Pawcatuck River to Lottery or Pawcatuck Bridge.

Stonington Harbour, on the western side of the town of that name, and on the north shore of Fisher's Island Sound, has a length of about 6 cables, and a breadth of 3½, with from 7 to 16 feet in it at low tide, and a fine breakwater, constructed by the Federal Government at an expense of 50,000 dollars, inside which there is a depth of 12 and 13 feet. On the days of full and change of the moon it is high water at 9h. 5m., the

Mean duration of Flood } Reckoning from the middle of one slack- } Mean duration of Ebb } water to the middle of the next..... }	6h.	15m.
	6	10
Mean duration of Slack-water	0	25
Height of mean High Water above the Plane of Reference	3ft.	10in.
Height of mean Low Water.....	1	3
Rise of the highest Tides observed	4	7
Mean Rise and fall of Tides	2	7
Mean rise and fall of Neap Tides.....	2	6
Mean rise and fall of Spring Tides	3	0

The fixed light on the extreme point of land has been mentioned, as one of the lights in Fisher's Island Sound, on page 130.

Bound into Stonington from the eastward, and having followed a W. ¾ N. course from the Gangway Rock buoy, lying 300 yards off Watch Hill Point, then as soon as Napatree Point bears N.E by N., steer N.W. by W. towards the highest part of the wood on Mason's Island, until the beacon on the end of the breakwater, which is a white conical stone with a black barrel on the top, comes on with a large circular building (an engine-house) at the inner end of the steam-boat wharf, bearing N. by E. ½ E.; haul up on this bearing, turn in close round the breakwater, and anchor just far enough in to swing clear of it in 2 fathoms, mud.

Smaller vessels can, when Napatree Point bears N.E. by N., run in with the breakwater beacon in line with the easternmost white house on the north-west side of the harbour, N. by W. ¾ W., passing over a sandy bank in 9 and 10 feet at low water, close to the west side of Bartlett's Reef,* and giving the lighthouse point a berth of a cable's length or more.

If from the southward, and resolved to enter the sound by Lord's Channel, bring the hotel, before mentioned, open a sail's breadth westward of Stonington Lighthouse, which will carry you through Lord's Channel in 6 to 3½ fathoms water. Steer now north-westerly so as to clear the shoal water extending from Bartlett's Reef until the light bears N. by E., when you may steer directly for the beacon on the end of the breakwater, into the harbour.

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* Bartlett's Reef lies ½ a mile S.S.E. ½ S. from Stonington Light, and has but 4 and 5 feet upon it.

Bound to Stonington from the westward, steer as already directed to where the spindle on Ellis' Reef bears North, distant 3½ cables' lengths, continue on an E. ¾ N. course, passing about a cable's length southward of Eelgrass Lightvessel, and when Stonington Lighthouse bears N.E. ¾ E.* run for it, until the beacon on the breakwater is on with the engine-house, then proceed as before. At night haul in for the anchorage when half a mile from the lighthouse, steering N. by E. ½ E.

Mystic River flows into Fisher's Island Sound at 3½ miles westward of Stonington. There are two channels into it, one for vessels of 8 feet draught and under to the eastward and northward of Eelgrass Ground and Whale Rock Spindle, and then between the south point of Mason's Island and the reef off the north end of Ram Island; the other for vessels drawing not over 10 feet, between Ram Island and Groton Long Point, and along the eastern side of Mystic lighthouse. They are buoyed, but are too narrow and crooked to be taken by a stranger without the aid of a pilot.

Mystic fixed light has been described in the list of lights for Fisher's Island Sound, given on page 130. Pilots are easily procured at from 1 to 4 dollars. Portersville is about 2½ miles above the lighthouse, on the western shore of the river.

West Harbour, on the north side of Fisher's Island, affords good anchorage in 4¼ or 2 fathoms, soft bottom. It has three entrances. The eastern one with 11 or 12 feet in it, between Middle Clump and Hawk's Nest Point; bring Clay Point, the next westward of Hawk's Nest, on with North Hill, about W. by S., run in on that range, doubling Clay Point at 150 yards off; stand in for Mount Prospect in the south part of the harbour, and anchor in from 1½ to 4 fathoms, muddy bottom. The North entrance is between West Clump and Flat Hammock, and has 13 feet in it; bring a clump of trees on Groton Long Point in line with a large house near the top of Fort Hill, on the back bearing of North, run in on this range standing South for the white house on the eastern shore of the harbour. The West Entrance, between South Hammock or Dumpling and the reef running 3½ cables northward from the base of North Hill, has 16 feet in it; bring the house (white) on the eastern shore just open of the west point of the harbour, run in on this range, round the west point, giving it a berth of 2 cables, and then anchor.

NEW LONDON.—The mouth of the Thames is immediately westward of Fisher's Island Sound, and northward of the Race. Into it there are three channels, the eastern or Pine Island Channel, 3 cables wide and from 15 to 30 feet deep, between Pine Island and the Black Ledge; the Black Ledge Channel, only 2 cables in width though 5 fathoms deep, between the Black Ledge and S.W. Ledge; and the western channel, which is ¾ of a mile wide and from 4½ to 6 fathoms in depth, between S.W. Ledge and the rocks lying off Goshen Point. Within these and abreast the lighthouse the river is ⅓ of a mile broad, and 4 and 5 fathoms deep; hence up to the town, a distance of 2 miles, in the fairway are not less than 4 fathoms in any part. It is high water here on the days of full and change at 9h. 29m.; springs range 3, neaps 2 feet; the mean duration of flood tide is 5h. 56m., and that of the ebb 6h. 26m. The fixed light shown from a white building on the west side of the entrance, at an elevation of 86 feet above the sea, may be seen at the distance of 14 miles; a whistle is blown during foggy weather.†

Directions.—If entering Long Island Sound from the S.E., when bound towards New London, the following precautions are to be attended to:—Observe, that the mark for avoiding the Cerberus Reef, or Middle Ground, is a conspicuous hill, with a notch in the centre, at the back of New London, named Bolle's Hill, which if kept a ship's length open, either to the eastward or westward of Mount Prospect (or the sandhills on the west end of Fisher's Island), will lead clear of the shoal in 10 or 15 fathoms to the eastward, and in 8 or 9 fathoms to the westward. The tide sets strongly over the shoal. In scant wind, or a calm, a vessel should anchor before any of the marks or bearings are too near.

A vessel bound for New London having brought the Gull Light to bear W. by N., or the light on Watch Hill Point N.E., may steer so as to bring New London Light-

* You will now be near a 16-feet rock, which lies with Latimer's Spindle S.W. ½ W. distant 4 cables' lengths. It should be left on the starboard hand going in.

† A notice published in the American papers in May, 1855, stated that a Daboll's Fog Horn had been placed near the light, which was worked by machinery, and sounded once every minute- the duration of the sound being 3 seconds.

house open of Fisher's Island; and when the spire of New London Church, bearing N. 8° W., is in one with the gap on Bolle's Hill, steering with it in that direction will carry you between the Race Rock and Valiant Rock, or, you may bring New London Lighthouse a sail's breadth to the eastward of the church spire, bearing N. 5° E., which will carry you to the westward of the Valiant Rock, or between that rock and the Gull Lighthouse. Thence steer for New London as hereafter directed.

In case the weather should be thick when you are bound to the westward through the Race, and New London church spire is not to be seen, steer for the Gull Lighthouse, keeping it northward of West, until New London Lighthouse bears N. $\frac{1}{2}$ E., when you must steer up for it; you will thus pass at about $\frac{1}{3}$ a mile eastward of the Gull Lighthouse. Should the Gull Lighthouse be brought to bear S. by W., you may steer N.N.E. for the Roads, making proper allowance for the tide, which is very strong.

In the winter season, when bound to or from New London, keep well to the westward, should the wind be at N.E. and stormy. Your course under such circumstances, for a good anchorage, is W.N.W. from the Gull, about 2$\frac{1}{2}$ miles; then haul up, should the wind continue at N.E., and steer N.W. until you get into 10 fathoms of water, muddy bottom. Anchor as soon as possible. Here you will be westward of Black Point, between it and Hatchett's Reef. This is the best place to ride in, with a N.E. gale or thick weather, when the harbour of New London cannot be attained. Here you will see Saybrook Light bearing about W. by N.

To run into and up the Harbour of New London in the deepest water, through the *Western Channel*, bring the lightvessel off Bartlett's Reef to bear W. by S. $\frac{3}{4}$ S., and New London Lighthouse N. $\frac{3}{4}$ W., distant about 1$\frac{1}{2}$ mile, and steer N. $\frac{1}{4}$ E., and it will carry you up in mid-channel in from 4$\frac{1}{2}$ to 6 fathoms. In this course you will leave on your port hand the Rapid Rock and Goshen Reef, the Mercer's Rock, and Eleven-feet Rock, the Hog's Back, Melton's Ledge, and also several others close in, but which can be avoided by not running nearer than 250 yards to the shore; and on the starboard hand S.W. Ledge, Frank's Ledge, and the Black Rock. Most of them are pointed out by buoys.* Vessels after passing the lighthouse are often embarrassed by light winds, and, after rains, by a strong surface current setting out on the flood-tide.

To make up *with a head wind*. When outside the South-west Ledge, keep the lighthouse between N.N.W. and N.N.E., but it is advisable not to bring the lighthouse

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* *Rapid Rock* lies S.S.E. from the buoy on Goshen Reef, and $\frac{7}{8}$ a mile from Goshen Point, and has but 10 feet water upon it; the marks for it are Long Rock on with Fort Griswold Monument, and the east end of Fisher's Island open to the northward of North Hammock. *Goshen Reef*: there are several rocks scattered over the shoal ground around this reef, for which there are no marks, but which are cleared by the ranges for the Middle and In-shore Channels. *Mercer's Rock*, on Sarah's Ledge, has 14 feet water upon it, and is buoyed; the marks for it are Shore Rock on with a large stone house about N.W. by N., and the east hillock on Eastern Point on with a house, bearing N.E. by N. Three cables' lengths within Mercer's Rock, with 4$\frac{3}{4}$ fathoms between, is a buoy placed on the outermost of a number of rocks (of which Shore Rock is the largest) fronting the land hereabout to the distance of $\frac{1}{3}$ a mile off. The 11-*feet rock* lies W. by S. $\frac{1}{4}$ of a mile from the lighthouse. *Hog's Back* and *Melton's Ledge*, which is buoyed, are in the bay named Green's Harbour, to the southward of Fort Trumbull, and out of the way of vessels proceeding on the above bearing (N. $\frac{1}{4}$ E.); if tacking towards the west side of the river hereabout, do not shoalen the water below 18 feet, or bring the lighthouse anything to the westward of S. by W.

S. W. Ledge has but 7 feet over it, and is marked by a buoy on its western side; it lies 9 cable's lengths S.E. by S. from the lighthouse. Between this ledge and the Black Rock is a small ledge of 13 feet, named *Frank's Ledge*, which lies with Fort Griswold Monument in one with the hollow in Latham's Chair, and a house and rock near the lighthouse in one; close-to, round this ledge, are 4 to 5 fathoms. The *Black Rock* is above water, and lies close in-shore southward of Eastern Point, and *Latham's Chair* close in-shore northward of that point.

It has been reported that near the South-west Ledge there is a rock not on the charts, of which the following is an account by the master of the vessel which struck upon it. We may remark that on reference to the chart of the harbour, (the result of a survey made by the officers of the United States Navy,) which was published in 1848, no mention of the rock is made, but on the contrary there appear to be 5$\frac{1}{2}$ fathoms at or near the spot alluded to:—"A few days since (May 10th, 1851,) while going out of New London Harbour, with a very light wind from the S.W., we struck on a rock about a mile from the lighthouse. The lighthouse then bore N.N.W. Owing to very light winds we soon got our vessel off, without sustaining any very serious injury. Vessels going out of the harbour should be very cautious, as it is no easy matter to get a vessel off rocks like these, and more especially where there is much wind. Probably if there had been a good breeze we should have lost our vessel."

to the eastward of N. ½ E. When up with the White Rock, before reaching Fort Trumbull, keep the Presbyterian Spire open of Fort Point, by which you will clear Melton's Ledge, which lies 150 yards to the eastward of Powder Island, and is marked by a buoy.

To run through *Black Ledge Channel*, you may bring the Presbyterian Spire on with Fort Point, N. by W., or the Eastern point of the harbour in one with Ocean House, N. ¼ E., as either of these marks will lead through clear of Frank's Ledge.

If from the eastward. Keep the lighthouse just open to the northward of Smith's house, bearing N.W. by W. ½ W., and it will take you through the Pine Island Channel in from 4½ to 3 fathoms. When to the eastward of Seaflower spindle, keep the lighthouse open to the southward of Pine Island, and it will clear the Horse-shoe and Groton Long Point. When up with Pine Island, which is bold-to, there being 16 feet immediately off it, keep Long Rock open to the southward of a large stone house to the westward, and you will clear the north point of Black Ledge.

Between Goshen Reef and the shore is the *Middle Channel;* it is narrow, but has a depth of from 13 to 18 feet. When running from the westward after passing Two-tree Island Channel, bring the large black rock, south of Two-tree Island, on with the first large tree to the northward of the house on Black Point, and you will go through the channel in 13 feet. When up with the buoy on Mercer's Rock, you may steer for the lighthouse, and pass into the harbour.

To go through the *In-shore Channel*, the one between the Middle Channel and the shore, which lies about one-eighth of a mile from Goshen Point, and amongst the rocks bordering the coast, follow the above range (the large black rock south of Two-tree Island on with the first large tree, &c.) until Middle Rock is on with the black rock, near the east point of the harbour, which latter mark will take you through the channel in 8 to 10 feet water. Pass 20 yards to the southward of Middle Rock, and then steer for the black rock until Fort Griswold Monument is open to the eastward of the lighthouse, when you may haul up the harbour, giving Quinnipeag Rocks (the rocks near the lighthouse) a berth of 100 yards. This channel is only to be followed when the wind is from the northward, and with a vessel drawing under 10 feet.

Bartlett's Reef, the south point of which is 3¼ miles S.W. from New London lighthouse, and a similar distance E. by S. ¾ S. from the extremity of Black Point, extends thence N.N.W. 1¼ mile, or to within ⅓ of a mile of the shore, and afterwards curves round W.N.W. ½ a mile to the buoy on its north-western extremity, where there is also an islet named Two-tree Island; its greatest breadth is about ¼ of a mile. In many parts the reef dries at low water, and there are narrow swatchways between these parts with 2½ fathoms and upwards in them. Close-to all round the reef are from 4 to 7 fathoms water, and you will find 13 fathoms, fine sand and mud, at less than ½ a mile off its southern extremity. A lightvessel with "Bartlett's Reef" painted in white letters on each quarter, lies off the south end of the reef, and exhibits two fixed lights at the heights of 28 and 35 feet, which are visible at a distance of 10 miles; during foggy weather a bell is rung and a horn sounded every alternate 5 minutes.

Two-tree Island Channel, between the north end of Bartlett's Reef and the shore, has a breadth of ⅓ of a mile, and is from 4½ to 13 fathoms in depth. When passing through it do not stand into the bay to the northward, as there are several sunken rocks scattered about in it, which would prove dangerous to a vessel striking thereon.

Eastward of Black Point, between it and Mill Stone Point, is *Niantic Bay*, which is said to be one of the best harbours of refuge on the northern shore of Long Island Sound, while the wind is northward of West and East. When between Bartlett's Reef and Black Point run for a small island, named White Rock, which lies ½ a mile westward of the eastern point, and as it is bold-to you may pass it on either side, and anchor to the north of it in 3½ fathoms. On the western side of Bartlett's Reef and off Black Point the bottom is hard, but between it is soft, thus serving as a good guide when running for the anchorage in foggy weather. In the north-east corner of the bay, westward and northward of Waterford Islet and rocks, there is a narrow channel of 10 and 11 feet water up to the village, through which the Niantic River empties itself into the sea.

The bay westward of Black Point is shallow with many rocks in it, the outermost

of which have a buoy on their southern end. Off this bay good anchorage may be had in 10 fathoms, muddy bottom, with a N.E. gale or in thick weather, bringing-to anywhere between Black Point and Hatchett's Reef.

Hatchett's Reef lies off Hatchett's Point, its eastern extremity being $2\frac{3}{4}$ miles about W. by S. $\frac{1}{4}$ S. from Black Point; here it is shoalest (5 feet) and is about $\frac{1}{2}$ a mile broad, with a buoy on its south-east and another on its north-east extreme, thence it extends W.S.W.-ward and joins the extensive sands fronting the entrance of Connecticut River, the water over it varying from 10 to 15 feet in depth. It should not be approached nearer than into a depth of 12 fathoms. Between its northern side and the shore there is a blind and narrow channel $3\frac{1}{2}$ and 7 fathoms deep, leading in from the eastward up to the Connecticut River Bar, through and over which small craft under the guidance of local knowledge frequently pass.

SAYBROOK.—The River Connecticut falls into Long Island Sound about 11 miles westward of New London, but the deposit brought down by it has heaped up an extensive bank of hard sand, which runs out 2 miles south-eastward from the points of entrance, and effectually bars the river from the approach of all vessels above a certain draught. The greatest depth that can be ensured at low water over the bar is from 5 to 7 feet, but to maintain the latter depth up to Lydne Point requires the aid of a skilful pilot. The wharves of Saybrook are $1\frac{1}{4}$ mile within the bar, and on the north-eastern side of Saybrook Point. On the days of full and change, high water takes place at 10h. 17m.; springs range 5 feet, and neaps $2\frac{3}{4}$; the duration of both flood and ebb is about 6 hours each, allowing 36 minutes for still water.

As a guide to vessels running for this place, a fixed light is exhibited from a white building erected on Lynde Point, on the west side of the mouth of the river; it is 80 feet above the mean level of the sea, and may be seen at a distance of 13 miles. A bell is rung in foggy weather.

Vessels bound to Saybrook, Essex, or any other place in the Connecticut River should employ a pilot. When one cannot be had and it is compulsory to enter, then the following instructions (1851) by Lieuts. Goldsborough, and Woodhull, U.S.N., will perhaps be found useful:—

"Vessels bound into Connecticut River will, when in $3\frac{1}{2}$ to 4 fathoms water, bring the lighthouse to bear N.N.W.,* then steer N.E. until the lighthouse bears N.W. by W., then steer N.W. $\frac{1}{4}$ W., or for the north-east end of Lynde Neck. When the beacon (on the port hand S.E. 3 cables from the light) bears S. by W., steer N.N.W. until abreast of the wharf at Saybrook Point.

When the light bears N.N.W. Duck Island will be well open with Cornfield Point, and Fort Fenwick (on Saybrook Point) open with the lighthouse. Vessels will find good anchorage by bringing the lighthouse to bear from N.E. by E. to N.N.E. one mile distant, in 3 and 4 fathoms water, soft bottom, and by hoisting a signal can always procure a pilot.

The changes on the bar are frequent, and sometimes very considerable in the course of even a few days, especially after a storm or freshet. Vessels, therefore, should not attempt to cross it without a pilot."

LONG SAND SHOAL is narrow, and has but from 6 to 15 feet over it, the shallowest part being near the middle. Its eastern end (15 feet) lies $1\frac{7}{8}$ mile S.S.E. $\frac{1}{4}$ S. from Saybrook lighthouse, whence it extends about W. $\frac{1}{2}$ S. 5 miles to the buoy on its western extremity, from which Saybrook light bears E.N.E. 5 miles. On its south side, near the centre of the shoal and about $\frac{1}{8}$ of a mile from it, in $7\frac{1}{2}$ fathoms, sandy bottom, a lightvessel has been placed; she is sloop-rigged, and shows a fixed light 40 feet above the water, which should be seen under ordinary states of the atmosphere at a distance of 10 miles; has a square cage-work day-mark at the masthead, and is painted red, with the name of the station in black letters on each quarter; in foggy weather a bell is rung and a horn sounded every alternate 5 minutes; and from it Saybrook light bears N.E. $\frac{1}{4}$ N., Bartlett's Reef lightvessel E. $\frac{1}{2}$ N., Little Gull Island light E. by S., and Falkner's Island light W. $\frac{1}{4}$ N.

A too near approach to Long Sand Shoal may be dangerous, as it is steep-to, and probably increasing so as to become connected at the north-east end with the bar of Connecticut River. It is also the more dangerous because the tide sets

* In doing this the buoy on the extremity of the bar should be left a short distance on the starboard hand; it lies about S.E. $\frac{1}{2}$ S. $1\frac{1}{4}$ mile from the lighthouse.

athwart it to the north-west and south-east. The buoy near the eastern end, with that on the western, and the lightvessel near the middle, will, however, very materially assist vessels passing up and down the sound in sailing clear of it.

About 2 miles westward of Saybrook lighthouse is Cornfield Point, southward and westward of which are several detached reefs, known by the names of Hen and Chickens, Crane, &c.; between the buoys marking their outer edges and Long Sand Shoal there is a channel one mile wide and 6 and 8 fathoms deep, through which small vessels sail, whose masters are acquainted with the locality, when going to or from Connecticut River. These reefs are separated from each other and from the shore by narrow and deep channels, and are steep-to on all sides.

The bays westward of Cornfield Point are shallow and rocky, and offer no advantages, except to the smallest craft; indeed, in the whole of the distance thence to New Haven there is no place of any importance, particularly to strangers, and the coast is fronted by shoals, rocks, and rocky islets, in and among which coasters find an in-shore passage with northerly winds. The outermost of these dangers, and, consequently, those most in the way of vessels navigating the sound hereabout are, Kimberley's Reef, Falkner's Island and the surrounding rocks, and East Ledge, and Brown's, Wheatons, and Branford Reefs; they are situated at distances varying from 2 to 3 miles from the land, but may be avoided if, when in the vicinity of Falkner's Island, the depth is not lessened under 15 fathoms, and, when well to the westward of that island, under 9 or 10 fathoms.

Kimberley's Reef, on which there are only 10 feet, is very small and steep-to with 5 and 8 fathoms a short distance off all round. As before stated, it lies $1\frac{1}{3}$ mile E. $\frac{1}{4}$ N. from Falkner's lighthouse, and 3 miles South from Hogshead Point, the nearest part of the shore.

Falkner's Island, &c.—Falkner's or Falcon Island is $2\frac{3}{4}$ miles southward from the nearest point of the main at the small and shallow harbour of Guildford, and bears from Little Gull Island light W. $\frac{3}{4}$ N. $24\frac{1}{4}$ miles, and from Stratford Point light E. $\frac{1}{4}$ N. $20\frac{1}{2}$ miles. A narrow reef of rocks extends from it nearly $\frac{1}{2}$ a mile northward, the extremity of which has a buoy upon it, and around Goose Island, a mile westward of Falkner's, there is likewise a dangerous reef running northward also about the same distance. The south side of Falkner's and the west side of Goose Island are steep-to, but on all others they will require to have a good berth given them. The white building on Falkner's Island, which has an elevation of 44 feet, exhibits a fixed light varied by flashes every $1\frac{1}{2}$ minute, at the height of 98 feet above the mean level of the sea, and visible 15 miles.

There is good anchorage for small vessels on the western side of Falkner's Island, with the wind from the eastward. In going in, give the south end of the island a small berth, and anchor with the light bearing E. by S., one-third of a mile from the island, in 3 fathoms, soft bottom. There is, also, a good and smooth bottom close on the north-east side of the island, where, with a westerly wind a vessel may anchor in $2\frac{1}{2}$ fathoms, with the lighthouse bearing S.W. by S.

The passage between Falkner's Island and the banks and rocks extending from the northern shore is $1\frac{1}{3}$ mile wide, and 5, 6, and 8 fathoms deep. In running through, there will be Kimberley's Reef and those on the north side of Falkner's and Goose Islands to avoid, on the port hand, and the rocks and shoals off the shore, on the starboard side; the former may be cleared by giving the lighthouse a berth of $\frac{3}{4}$ of a mile, and when it bears S.E. by E. and Goose Island South, you will have passed them; and the latter by keeping Hammonasset Point to the northward of East. This point may be known by having two small bluffs at its extremity; it bears E. by N. $\frac{1}{2}$ N. $5\frac{1}{2}$ miles from Falkner's lighthouse, and is surrounded by rocks and a shallow flat. As soon as Goose Island bears South you should steer more southerly to clear the reefs hereafter mentioned.

Sachem's Head Harbour is about 3 miles N.W. of Falkner's Island, and affords good shelter from all but westerly winds which throw in a very heavy sea. Sachem's Head forms the south and Joshua's Point, upon which is a small clump of cedars, the north side of this little harbour, wherein the depth is only from 9 to 12 feet at low water. High water on full and change days at 11h.; springs range $6\frac{1}{2}$, and neaps $4\frac{1}{4}$ feet. The Goose Rocks lie $\frac{1}{3}$ of a mile off the harbour's mouth; they must have a good berth in entering from the westward, because, at the distance of 2 cables' lengths in a south-westerly direction from them, there is a small isolated ledge with only 3 feet upon

it. To run in, bring the small clump of cedars, which stands on the north chop of the harbour to bear North, steer for it, and give the south chop a berth of a cable's length. When the harbour is fairly opened, haul in and anchor in from 9 to 11 feet on soft sticky bottom. Very small vessels may run into the little creek in the south-east corner, and, making fast to the rocks, be perfectly sheltered from all winds, lying in the mud at low water.

Two miles westward of Sachem's Head is a group of islets, named the Thimbles. One-third of a mile south-westward of the Outer Thimble is *Wheaton's Reef*, with a buoy on its northern end. *Brown's Reef* is southward of Wheaton's, and *East Ledge* south-eastward; the latter bears S.W. by S. $\frac{1}{2}$ S. $\frac{3}{4}$ of a mile from the Outer Thimble.

Branford Reef has a beacon on its northern part, and is dry at very low tides; it is not of very great extent, but deep water of 7 and 8 fathoms is found at a short distance off it all round. Falkner's Island bears from it E. by S. nearly 7 miles distant, and New Haven light N.W. by W. $\frac{1}{2}$ W. $4\frac{3}{4}$ miles. Therefore, to pass clear on the southern, or outside all these rocks, do not bring Falkner's Island lighthouse southward of E. $\frac{1}{2}$ S., or decrease the depth below $8\frac{1}{2}$ fathoms.

There is a good passage northward of the foregoing reefs, between them and the Outer Thimble, Inner Reef, and Nigger Heads, but, although the extremities of these dangers are distinguished by buoys or beacons, and the water deep enough for the largest vessels, the channel should not be attempted by a stranger.

NEW HAVEN HARBOUR is 12 miles westward of Falkner's Island, and nearly half way up Long Island Sound; it is formed by the union and at the outlet of the Quinnipiac and Mill Rivers, and is exposed to southerly winds. The water shoalens gradually up to the bar near Fort Hale, whereon the greatest depth at low water is 10 or 12 feet; but this soon increases again to 15 and 18 feet, and then, as you approach the town, decreases to 7 and 8 feet. The channel-way has a breadth of 4 cables at the bar and of only one cable near the end of Long Wharf. High water takes place on the days of full and change of the moon at 11h. 16m. The

Rise of highest tide above the plane of reference is.....	7ft.	7in.
Height of mean High Water.....	6	4
Mean rise and fall of Tides.....	5	8
Mean rise and fall of Spring Tides.....	6	6
Mean rise and fall of Neap Tides	5	1

The flood has an average duration of 6h. 24m., and the ebb of 6h. 5m.

The lighthouse shows a fixed light 93 feet above the sea, visible 15 miles; it stands on the extremity of Five-mile Point, on the eastern side of the entrance; a bell is tolled in foggy weather: on the end of Long Wharf there is a fixed red light 44 feet above the mean level of the sea.

DANGERS.—The outermost of these, on the port hand going in, are the *Luddington Rocks*, which are situated $1\frac{1}{2}$ mile S.W. from the lighthouse, and consist of two sharp pointed rocks 10 yards apart, with $12\frac{1}{2}$ feet upon them; around them are 17 and $19\frac{1}{2}$ feet. Nearly $\frac{3}{4}$ of a mile N.N.W. from the Luddington Rocks is a hard patch of 11 feet, and between this patch and the western shore are several others of 5 and 6 feet water.

On the starboard hand are the S.W. Ledge, Quixes' Ledge, Adams' Fall,* &c.; therefore the lighthouse, which appears very conspicuous, should not be approached too near while bearing to the northward of N.E. by E. The *S.W. Ledge* is marked by a buoy, bearing from the lighthouse S.W. by S. $\frac{1}{2}$ S., one mile, and from the spindle on Quixes' Ledge W.S.W., half a mile. From 5 to 10 feet is the depth on this ledge at low water, and there are from 10 to 18 feet between it and Quixes' Ledge. *Quixes' Ledge* has from 2 to 5 feet on it, bears from the lighthouse S. $\frac{1}{2}$ E., distant about $\frac{3}{4}$ of a mile, and is marked by a spindle. North-westward of Quixes' Ledge distant $\frac{1}{4}$ of a mile is another rocky shoal of 6 feet, the depth between them being 15 feet. Between these shoals and Morgan's Point are 8 to 12 feet, hard ground, but no navigable channel. The Round Rock, dry at low water, is about half a mile East of Quixes' Ledge, and about a quarter of a mile off the shore. *Adam's Fall*, a shoal of 4 to 5 feet, is

* We believe that attempts are making to remove some of these obstructions by blasting.

distant about half a mile from the lighthouse point, and is marked by a buoy, which bears from the lighthouse S.W. ⅓ W., and from the spindle on Quixes' Ledge N.W. ¼ W., about half a mile. Between Adam's Fall and Five-mile Point is a depth of 17 to 16 feet at low water, but no vessel should attempt to run through.

DIRECTIONS.—If bound into Newhaven, give Falkner's Island a berth of about one mile, and steer W. by N., until the light on Five-mile Point is north of you. You will now be in 6½ fathoms, soft ground, and may steer N.W., giving the lighthouse a berth of 1¼ miles, to avoid the S.W. Ledge, the buoy on which must be left on the starboard hand. When the lighthouse bears N.E., you may steer up N.N.E. for Fort Hale, leaving the buoy on Adam's Fall on your starboard hand. In this course you will probably pass over the Luddington Rocks, already mentioned; therefore, what is better still, as soon as Fort Hale comes in line with Fair Haven Spire (a white wooden church), follow that direction, and when nearly abreast of the fort, give it a berth of one-fourth of a mile, and steer up N. ½ W. for the end of Long Wharf, leaving Black Ledge, which is ¼ of a mile N.W. of the fort, on your starboard hand.

A little to the north-westward of Fort Hale is a buoy in 15 feet, and above that, at about ⅜ of a mile on the opposite side of the channel, is another in 9 feet, on the extremity of the shoal ground extending from Sandy Point. Close off the end of Long Wharf are 7 and 8 feet, soft mud. It is recommended when sailing up to keep the lead going; the soundings from Adam's Fall upwards are upon soft mud.

Coming from the eastward, vessels occasionally pass between the buoy on the S.W. Ledge and the spindle on Quixes' Ledge, as there are 3¼ fathoms between, excepting in mid-channel, where there is one small spot of 10 feet: this lies nearer the S.W. Ledge than the spindle. Steer about midway between the buoy and the spindle, so as to leave the buoy on Adam's Fall at the distance of a quarter of a mile. Bring the leading mark up to Fort Hale on, namely, Fort Hale in range with Fair Haven Spire, which will lead you up in from 17 to 14 and 10 feet, soft ground. Give the fort a berth when rounding it, and steer as above directed for Long Wharf, going into not less than 7 feet.

Should you wish to anchor in Morris' Cove, bring the light on Five-mile Point to bear S. by E., when anchorage may be obtained in 2 to 1½ fathoms, muddy bottom. Your course thence up the harbour is about North, with a fair wind, and in beating up, the above-mentioned directions must be followed, to keep the lead going, in order to avoid the hard ground on the western shore, for while you continue on a bottom of mud, no danger can possibly ensue.

Vessels bound in from the westward must leave both buoys on the starboard hand, approaching no nearer to either of them than half a cable. When beating in, your soundings will be from 2 to 3 and 4 fathoms, but you must be careful to stand no nearer than 2 fathoms on the west shore, on account of the hard ground.

To these directions may be added the following by Lieutenant G. S. Blake, of the U.S.N.:—

"Bring the Lighthouse to bear E.N.E., and run for it until Fort Hale is in range with the larger of two church spires next each other in the village of Fair Haven. You will then be about half a mile from the light in 3 fathoms water, and but a short distance to the westward of the buoy on Adam's Fall Ledge. S. ½ E. you will see the buoy on the S.W. Ledge, and still further to the eastward, the spindle on Quixes' Ledge.

Run into the harbour upon the above-mentioned range, Fort Hale and the Spire, until the lighthouse bears S. by E., when you will be in 2 fathoms, soft bottom. Then steer up a little to the westward of the head of Long Wharf, and you will soon deepen into 2¼ and 2½ fathoms. A little above Fort Hale is a buoy which you leave to the eastward, and ⅝ of a mile further up, another, which you leave to the westward. Soon after leaving this last buoy, you will shoal to 8 and 7 feet, carrying this depth up to the head of Long Wharf."

STRATFORD.—The coast from New Haven trends south-westward 8½ miles to Stratford Point, and should have a berth of over ½ a mile, for from the projecting points a rocky off-lay extends almost to that distance. There is no place of importance between, though small vessels will find temporary anchorage in 12 feet, in a small bay named Milford Haven, midway between Charles Island and Cedar or Pine Trees Point. Stratford Harbour, formed at the outlet of the Housatonic River, is a bar harbour with

only 3 feet in the channel way at low water; it is, therefore, only used by small coasting vessels. On Stratford Point, the western side of the entrance, there is a lighthouse, striped black and white, showing a light revolving once in every 1½ minute, at an elevation of 53 feet above the mean level of the sea; and being visible at a distance of 12 miles, is of great use to all vessels beating up or down Long Island Sound.

The coast immediately westward of Stratford Point is fronted by an extensive hard sandy flat, the 3-fathom edge of which is in some places nearly 1½ mile off; therefore vessels not bound into either Bridgeport or Black Rock Harbour, should give the shore a good berth, more particularly as there are some 9-feet patches upon the bank, the outermost of which, we believe, is marked by a buoy.

MIDDLE GROUND lies 5½ miles S. ½ W. from Stratford Point, and 5 miles N. by E. ¼ E. from Old Field Point lighthouse, and has but 2 feet least water upon it at low tide; it is about ½ a mile in extent from north to south, with a buoy on each end, and ¼ of a mile broad. You may pass on either side, according to circumstances, but the southern channel is the one most generally used, especially as a light-vessel off the south end of the shoal offers additional assistance in clearing that danger. This light-vessel is moored in 11 fathoms, ½ of a mile south-west of the shallowest part of the Middle Ground, and should be passed on its southern side. It has the name of the station painted in large black letters on each quarter, and shows two fixed lights, 32 and 40 feet above the level of the sea, visible at the distance of 10 miles; during foggy weather a bell is rung and a horn sounded every alternate 5 minutes.

BRIDGEPORT.—The small harbour of Bridgeport, at the mouth of Pequanock River, is 3½ miles westward of Stratford Point lighthouse, and though difficult of access, is much resorted to by coasters. The channel up to the town is very narrow, and leads over an outer and an inner bar, the least depth at low water being 6 and 7 feet, similar to that abreast the wharves of Bridgeport. Beacons and buoys point out the fairway, but a stranger should employ a pilot. On the west side of the entrance of the channel into Bridgeport, and upon a white frame-work building, there is a small fixed red light 23 feet above the water, visible about 6 miles. High water on the days of full and change at 11h. 11m.; springs range 8¾ feet, and neaps 5.

As before stated, the entrance to this harbour is obstructed by two bars, the outer one of which has been deepened by dredging, and the cut, which is ⅜ of a mile long, is indicated by a buoy at each end in line with the deepest water. The inner or northern buoy bears from the outer buoy N. ¾ E., distant ⅜ of a mile.

To run in, keep these buoys in one, passing the lighthouse on your port hand and the inner buoy close upon the starboard bow, to pass the outer bar; then keep a couple of cables' lengths south-easterly, or outside of the line of the north-east and south-west beacons upon the edge of the western flats, standing on across the inner bar in from 6 to 10 feet water. Haul up round the north-east beacon, deepening to 16 feet, when a buoy which marks the north-east point of the western flats, will bear N.W. by N., ⅜ of a mile distant. Run up through the channel for the town, keeping this buoy a little on the port bow.

There is safe and good anchorage between Bridgeport entrance and Fairweather light, 1¾ mile westward, in all winds from W.S.W., by the north, to E.N.E. The shore on the eastern side of the light is bold, having 3 fathoms almost close to it, and deepening gradually outwards. This bay is considered one of the best places for anchorage on the north shore of Long Island Sound, as the ground is good and the soundings shoalen moderately, until at a mile from the shore there are 4 to 3 fathoms water, with the light bearing about West; thence to the coast the depths are 18 to 6 feet. In coming hither from the eastward, after passing at about 2 miles from Stratford Point light, the course to Black Rock light will be W.N.W., and you should keep in soundings on the starboard side of not less than 4 fathoms: and outward, or on the port side, to not more than 8 fathoms.

BLACK ROCK HARBOUR, a small place of refuge ¼ of a mile in extent from north to south, and 3 cables' lengths broad, formed by the main on the western and Fairweather Island on the eastern side, and open to the southward, lies 5½ miles westward of Stratford Point lighthouse, and round to the eastward and northward of Fairfield Bar, and is safe and easy of access, the depth in it varying from 9 and 12 feet at the entrance to 6, 8, and 11 feet abreast the village. For the time of high water, and the rise and fall of the tide, see Bridgeport, preceding. Fairweather Island, which is low and narrow, has upon the south end of it a lighthouse, 35 feet high, showing a

fixed light at 52 feet above the sea, visible 12 miles. A reef, partly awash at low water, runs about a quarter of a mile to the southward from the lighthouse, and has on its extremity a buoy. When you have rounded this buoy, on your starboard hand, the harbour will be fairly opened, and you may run up N. ½ E., in 8 to 10 feet.

At 1⅛ mile S. ¾ W. from Black Rock lighthouse is the outer end of the *Fairfield Bar*, a reef running off 1¼ mile in a S.E. ¾ E. direction from Shoal Point, and being dry at low water serves as an efficient protection to Black Rock Harbour against heavy seas from the southward.

At the extremity of this reef there are some rocks awash at low water, named the Cows, and near them is another cluster, named the Penfield's Reef; these rocks lie just within the 18-feet line, and have from 4 to 6 fathoms at ¼ of a mile to the eastward of them. This reef is marked at its extremity by a beacon upon rock, named the Huncher, and there are two buoys on the south-eastern and southern sides of this danger, which will assist a vessel in ascertaining its limits.

If coming into Black Rock Harbour from the eastward, when abreast of Stratford light (which pass at a distance of 2 miles to avoid a shoal spot south of it), bring Black Rock light to bear W.N.W., and steer W. by N. ½ N., keeping it on the starboard bow.

Enter midway between the light and beacon, passing the light until it bears N.N.E.; then haul up N. ½ E., into the inner harbour. Give the lighthouse a berth of from ⅛ to ¼ of a mile, and anchor in 2 fathoms, soft bottom, with the light bearing anywhere from East to S.S.E.

If coming from the westward, keep in not less than 4 fathoms to avoid Penfield's Reef, to the southward of the beacon, and the Cows to the northward. After passing the beacon, steer East until you bring Black Rock light to bear N. by W., then run for it until midway between the light and beacon, when you may steer as before.

From Fairfield Bar westward to the Norwalk Isles there is no place of importance, except Southport, and that place is only visited by the smaller class of coasting vessels. The intervening coast should have a good berth given it, for shoal water, especially about Pine Creek Point, extends ¾ of a mile from the land, and a small patch of 12 feet, hard sand, lies ⅝ of a mile S. by E. from Sherwood's Point, with 3 and 4 fathoms all around it.

THE NORWALK ISLES are connected with one another, and surrounded by sandy and rocky flats which dry in parts at low water, and render it necessary to give the islands a wide berth in passing. Including the rocks in their vicinity, they commence about 10½ miles westward of Stratford Point, and continue thence westward nearly 6 miles, and lie at distances of from 1 to 1¾ mile from the mainland, to which they are joined by very shallow and hard flats. Within the islands are the mouths of the rivers Saugatuck and Norwalk, upon the banks of which, some 2 or 3 miles up, are Westport and Norwalk, small places where coasting vessels of very light draught only are enabled to go.

CAWKIN'S ISLAND, the easternmost of the Norwalk group, is low, and a shoal runs from it southward and eastward ¾ and 1¼ mile, with several sunken rocks upon it, the south-eastern edge of which is marked by a buoy. Anchorage may be had on the western side of Cawkin's Island in 9 or 10 feet water, bottom of soft mud and sand. To proceed to this anchorage bring the highest part of this island (which is a steep bluff on its south-east side, having a few scattered cedars on its summit) to bear N. ⅛ E., and the centre of Goose Island (which is low and covered with small cedars) to bear W. by N. ½ N., when you will be in about 3 fathoms, sandy bottom, and the channel into the harbour will be open and bear N.W. by N. Run in upon this course (N.W. by N.) keeping in mid-channel between Goose and Cawkin's Islands, and be careful not to get into less than 2 fathoms on either hand. When going in, leave the Channel Rock (which lies 2 cables' lengths, S. by W. ½ W., from Cawkin's Island) upon the starboard, and Peck's Ledge (which lies 3 cables' lengths N.N.E. from the north end of Goose Island) upon the port side; the channel between these two dangers is ⅜ of a mile wide, with 14 to 17 feet water in the middle. The soundings are irregular, but the depth is not less than 14 feet, until well within Peck's Ledge, when it shoals gradually. Anchor in 10 feet, soft bottom, the bluff on Cawkin's bearing E. by S. Easterly gales cause a very heavy swell in this harbour, but the holding-ground is good, being a mixture of soft mud and sand.

SHEFFIELD ISLAND is the westernmost of the Norwalk Islands, and is distinguished by the white lighthouse near its western end; the lighthouse is about 16 miles west-

ward of that on Stratford Point, and stands at the western entrance of Norwalk River, is 34 feet high, and shows a light revolving every $1\frac{1}{2}$ minute, at 40 feet above the sea, visible 11 miles; it appears alternately of a red and white colour, by which it may readily be distinguished from the light on Stratford Point. On the days of full and change high water takes place here at 11h. 1m.; springs range $8\frac{1}{2}$, and neaps 7 feet; the duration of flood and ebb tide is nearly equal, namely about 6 hours each.

A shoal with several sunken rocks upon it, some awash at low water, runs off from the lighthouse point $1\frac{1}{4}$ mile in a W. by S. $\frac{3}{4}$ S. direction, and has a buoy upon its extremity. There is likewise a detached shallow patch of 4 fathoms, lying at $1\frac{3}{8}$ mile S.W. $\frac{3}{4}$ S. from the lighthouse, which bears the name of Budd's Reef; around it at a very short distance off are 5, 8, and 12 fathoms.

An excellent harbour exists on the northern side of Sheffield Island, where shelter in all weathers may be had by vessels drawing 10 feet of water and under. To run in, pass midway between the buoy on the extremity of the ledge, extending from the west end of Sheffield Island, and Fish Island (a small low island covered with cedars lying near the main shore), from which the buoy bears S.E., distant about $\frac{3}{4}$ of a mile. Steer E.N.E., shoaling gradually from 4 fathoms to 12 feet on a rather irregular bottom, and anchor in 12 or 13 feet, soft bottom, with the light bearing S. by W. When running in, do not edge too closely towards the reef, because it is steep-to, there being 3 to 4 fathoms close to its edge, but keep fully a quarter of a mile to the northward of the line from the buoy to the light.

Towards the main shore, within the entrance to Sheffield Island anchorage, the water shoalens more gradually than it does towards the edge of the reef extending from Sheffield Island, but you should not edge too near it, as it is not clear of dangers, there being a reef of 7 feet W. by N. $\frac{1}{2}$ N. $\frac{7}{8}$ of a mile from the lighthouse.

From Sheffield Island westward to Captain's Islands are several small and shallow harbours, including Stamford, Cos Cob, &c., to which small coasting vessels resort. The coast is much indented, and the projecting points should have a wide berth given them, as they are prolonged under water to a considerable distance out, besides which there are the Smith's Rocks and the Cows, situated respectively $3\frac{1}{2}$ and $5\frac{1}{4}$ miles westward of Sheffield lighthouse, and above $\frac{3}{4}$ of a mile from the nearest points of the land; their outer extremities are marked by buoys. On the eastern side of Long Neck Point good anchorage may be had in about 3 fathoms, with Sheffield light bearing nearly East, distant $2\frac{1}{2}$ miles. Two miles westward of the Cows Rocks is Greenwich Point, which is bare of trees, and forms the south-east point of a neck of land, the south-west point of which is named Flat Neck Point, and is covered with trees; these points are fronted by shallow flats, the 3-fathom edges of which are distant nearly $\frac{1}{2}$ a mile from the land.

CAPTAIN'S ISLANDS are two in number, named the East and West, and lie above a mile off shore, at about 10 miles westward of the Norwalk Group. There is a passage between them and the main, through which not less than 10 and 12 feet can be carried by any one acquainted with the position of some 4 or 5 rocky ledges, which form the only obstacles to its free use by a stranger. The islands are low, situated on a shallow flat, and between and around them are many rocks above and under water, especially on the north-eastern side of the East Island, where they extend off 4 cables' lengths. Here high water takes place at 11h. 1m. on the days of full and change; springs rise $8\frac{1}{2}$ feet, and neaps 7.

The white lighthouse on the eastern end of the West Island is 34 feet high, and shows a fixed light at an elevation of 62 feet, visible in clear weather at the distance of 12 miles.

On the north side of the East Island there is excellent anchorage in from 2 to 4 fathoms, good holding ground, and shelter from all but south-easterly winds, which, when heavy, send in some swell. The channel to it, between East Island and Flat Neck Point, is from 4 to 8 fathoms deep and $\frac{1}{4}$ a mile wide,—that is, from the depth of 2 fathoms on each side—and when running in steer N.W., keeping mid-way between the two, or give the island or hummock a berth of $\frac{1}{2}$ a mile, as broken rocky ground makes off from it in a N.E. direction. When well within the line of the island and Flat Neck Point, with the lighthouse bearing S.W. $\frac{1}{2}$ W., haul up to the westward, and anchor in 18 feet, sticky bottom, with the hummock or East Island bearing S.S.E.

Also, on the northern side of the West Island, a vessel will find anchorage in from 15 to 17 feet water, soft bottom, nearly midway between West Island and Calf Island; the latter island is $\frac{1}{2}$ of a mile north-westward of the former. The passage to it lies

between the west end of West Island and a small ledge with 4 feet upon it, situated right in mid-channel between that island and the shore of the main; from the ledge the lighthouse bears E. ½ N. distant ⅞ of a mile, but the channel between it and the island, though from 12 to 18 feet deep, is not more than 3½ cables wide. To sail in, bring the lighthouse to bear N.E. ½ N., and the western points of Calf Island in range, N. by W. ½ W.; run in on this range until the lighthouse bears E. by S. ¼ S., then steer E. by N. ½ N. and anchor in 17 feet with the lighthouse bearing S.E. by E.

Hence to Execution Rocks the northern shore of the sound should be avoided, particularly by strangers, for there is no place of any consequence along the intervening coast, but numerous rocks and reefs detached and extending from the land, to distances varying from ¼ to ¾ of a mile, render it advisable to give it a good berth.

We proceed next to give a description of the southern shore of Long Island Sound, after which that of the channel from Execution Rocks to Throg's Point, and thence through Hell Gate to New York.

SOUTH SIDE OF THE SOUND.

Long Island Sound is bordered on the south by the north side of Long Island, which appears with an uneven surface, with numerous bays, of which the principal are Gardiner's, Peconic, and Smithtown. Numerous islands also line the coast, Gardiner's Island being the principal and most important, containing 2500 acres; this island is noted in the Union for its cheese and butter. Shelter Island, further in, forming the western side of Gardiner's Bay, is more extensive, and contains 8000 acres.

MONTAUK POINT, the eastern extremity of Long Island, has a white stone lighthouse upon it, showing a fixed light varied by flashes once in every two minutes, at the height of 160 feet above the mean level of the sea. During the ordinary state of the atmosphere, the fixed light, between the intervals of flashes, may be seen at the distance of 20 miles, and the flashes from 3 to 5 miles further. A strand of 6 to 18 feet surrounds the point, and extends off it and the coast to the north-westward, about ½ a mile, but southward and westward to not more than ⅓ of a mile; close to its edge are from 4 to 10 fathoms, bottom of sand and specks.

Montauk Shoal lies 2⅔ miles S. by E. from the lighthouse, is small, and has from 4 to 5 fathoms over it, bottom of hard sand. It is plainly shown by the tide rips, and the sea breaks upon it in heavy gales from seaward. Between this shoal and the point there are from 6½ to 12 fathoms, and from 6 to 12 close-to all round it.

Between Montauk Point and Block Island there are 10 to 15, and for a small space 20 and 23 fathoms, and as you approach the island you will meet with the South-west Ledge, of which mention has been previously made. On the N.W. side of this ledge you will suddenly shoalen your water from 13 to 6 fathoms, and before a second cast of the lead is obtained, you will be over its shoalest part into 7, 8, 10, 12, and then 14 fathoms. With Montauk Light bearing W. ¾ S., distant 8 miles, you will be in 7 to 12 fathoms on the western edge of the ledge, from which to the point you will get 12 to 9, 10, and 7 fathoms. Towards the lighthouse, when it bears from W. to S.W. by W., the bottom is strong, consisting of grey sand and gravel; but towards the ledge the bottom is of coarse sand, and over it there is a strong tide and rippling. When rounding Montauk Point, you can go within a cable's length of the surf, and have 17 to 20 feet, but to keep further off will of course be more prudent.

Shagwong Reef, &c.—At 3¾ miles N.W. ½ N., from Montauk Lighthouse, is a small reef, named the Shagwong, which has but 5 feet water on it, and is marked by an iron bell boat, painted black with the name in white letters on the hull and framework. Close to it on all sides there are 4 to 6 fathoms, and between it and Long Island there is a four-fathom passage, through which ships may pass, only taking care to avoid the Washington Shoal, a shoal of 12 to 18 feet, the shallowest part of which lies ⅛ of a mile from the shore. The Shagwong Shoal is shown by the tide rip. When bound into Fort Pond or Napeague Bays, pass round to the eastward and northward of it, and bring Rocky Point open of Culloden Point (the extremes of Fort Pond Bay) before steering to the south-westward.

Middle Ground or Cerberus Shoal.—At nearly mid-channel between Montauk Point and Fisher's Island, is the Middle Ground or Cerberus Shoal, which is highly dangerous, as it consists of pointed rocks, and has but 13 feet upon it; it is however usually shown by the tide rips. It is of but small extent, and bears from Montauk

Lighthouse, N.N.W. ½ W., 7¾ miles; from Gull Island Light, E.S.E. ⅛ S., 7 miles; and from Watch Hill Light, S.W. ⅜ S., 9 miles. On the south and west sides of the shoal the water deepens quickly from 5 to 12 fathoms: and on the north side it is steep-to, there being close to its edge 14 to 15 fathoms. Caution is always requisite in approaching this shoal, the more particularly as little, if any warning, is given by the lead.

The mark formerly given for avoiding the Cerberus Reef, or Middle Ground, is a conspicuous hill, with a notch in the centre, at the back of New London, named Bolle's Hill, which, if kept a ship's length open, either to the eastward or westward of Mount Prospect (or the sandhills on the west end of Fisher's Island), will lead clear of the shoal in 10 or 15 fathoms to the eastward, and in 8 or 9 fathoms to the westward. Or, a single bearing of either of the three lights mentioned can be taken so as to lead clear of it when in its vicinity. The tide sets strongly over the shoal. In scant wind, or a calm, a vessel should anchor before any of the marks or bearings are too near.

Fort Pond Bay.—At 5½ miles to the westward of Montauk Point, and on the north side of Long Island, is Fort Pond Bay, which is a very convenient place, clear of outlying danger, containing excellent anchorage in from 6 to 8 fathoms, but open to the northward. At the bottom of the bay is a pool of fresh water, named Fort Pond. Between this bay and Montauk Point there is a lake named the Great Pond.

Napeague Bay, or the space between the south-east side of Gardiner's Island and the coast westward of Fort Pond Bay, has a depth of from 8 to 5 fathoms gradually shoaling towards the sand-banks which occupy nearly the whole of the passage between the south point of Gardiner's Island and the adjacent shore of Long Island, leaving only a very narrow and winding channel among them, 3 and 4 fathoms deep, into Gardiner's Bay. Napeague Harbour, a small and almost land-locked basin in the south part of Napeague Bay, with 6, 8, and 17 feet water in it, is but seldom frequented.

THE RACE, or the channel between the western end of Fisher's Island and the Gull Island, is the one principally used by vessels bound into and out of Long Island Sound, as it is both wider and deeper than the channel between the Gull Islands and Plum Island, or than that between Plum Island and Oyster Pond Point, named Plum Gut. The depth varies from 7 to 40 fathoms, and the width is 3¾ miles, but there are two dangerous rocks in the way, named the Race and Valiant Rocks, the position of which should be avoided.

On the days of full and change, high water takes place at 9h. 38m.; spring tides rise 2¾, and neap 2¼ feet; the average duration of the flood or rising tide being 6h. 1m., and that of the ebb or falling tide 6h. 21m., allowing 37m. for still water. During the first quarter the flood runs by compass in a N.W. direction, at the rate of 2¼ miles an hour; during the second N.W. by W., $3\frac{9}{10}$ miles; in the third W. by N. ¾ N., 3⅜ miles; and during the last quarter N.W. by W. ¼ W, $1\frac{7}{10}$ miles per hour. For the first quarter of the ebb the tidal current sets S.E., with a velocity of rather more than 2 miles an hour; in the second quarter nearly in the same direction, but with a rate increased to 3¾ miles; during the third quarter S.E. by E. ¼ E., 4 miles; and in the fourth quarter about E. by S. 1⅛ mile per hour.

The *Race Rock* lies S.W., ⅓ a mile from the west end of Fisher's Island, and has but 4 feet on it, with 14 to 18 fathoms close-to, and 5 and 7 fathoms between it and the island. It is marked either by buoys or a spindle. The mark to clear it on the western side is Mystic Lighthouse open to the northward of North Hill.

The *Valiant Rock* lies in the middle of the Race Channel, and has but 17 feet upon it, with 5 to 13 fathoms close-to all round. It bears from Little Gull Island N.E. by E. ¾ E. distant 2 miles, and from New London Lighthouse S. ¼ E. 5⅝ miles. The marks for it are, the South Hammock Islet just open to the northward of North Hill, in Fisher's Island; New London Lighthouse on with the gap in Bolle's Hill, which hill is to the northward of New London and Little Gull Lighthouse just open to the southward of Great Gull Island.

DIRECTIONS.—To run for the Race Channel from the south-eastward, bring Montauk Lighthouse to bear N. by W. ¾ W., distant 1¾ miles, when you will be in 8 fathoms, sandy bottom. Steer N. ¾ E. 3¼ miles, until the lighthouse bears S.W. by S., distant 2 miles, when you will be in 7 fathoms, gravelly bottom; haul now to the N.W. ½ W., and run 13 miles, which will take you into the Race Channel, one mile E.N.E. from Little Gull Island Lighthouse, leaving the Shagwong Reef one mile to the southward and westward, and Cerberus Shoal one mile to the northward and eastward.

If wishing to pass to the eastward of the Cerberus Shoal when Montauk Lighthouse bears S.W. by S., distant 2 miles, steer N.W. by N. ¼ N., 7¼ miles, until Montauk Lighthouse bears S. by E. ¾ E., 8¼ miles, and Gull Light W. by N. ¼ N., when you will be in 25 fathoms, grey sand and black specks. Steer now W. by N. ¾ N., 6¾ miles, leaving the Cerberus Shoal 1¼ mile to the southward and westward. when, if these courses are made good, you will be in the Race Channel as before, and southward of the Valiant Rock.

If you are off the south end of Block Island, give it a berth of one mile, passing between it and the South-west Ledge in 7 and 8 fathoms, and steer W.N.W., 18 miles, and when Gull Light bears W. ½ N. steer W. by N. for about 3½ miles, you will then be at the entrance of the Race Channel as before. In this course you will go to the northward of the Cerberus Shoal.

If from Martha's Vineyard, a course West, southerly, will take you to the Race Channel. By steering thus you will pass 1¾ mile to the northward of the reef extending from the north point of Block Island, in 22 to 24 fathoms, fine dark grey sand and specks.

If from Narragansett Bay. When Beaver Tail Lighthouse bears N. ¾ E., distant ½ a mile, you will be in 13½ fathoms, rocky bottom, and should steer S.W. ½ S., 6¾ miles, until Point Judith Light bears N. ¾ E., 1 mile, when you will be in 7 fathoms, grey sand and gravel. From this position a course W. ¾ S., 28¾ miles, will take you into the Race southward of Valiant Rock, and to a position E.N.E. 1 mile from the Gull Lighthouse.

If instead of running for the Race, you wish to run for Fisher's Island Sound, bring Point Judith to bear N. ¾ E. as before, and steer West, 17½ miles, which will take you up to the entrance of the Sound, which is between Watch Hill Light and Watch Hill Reef, in 4½ fathoms, rocky bottom. See page 131.

With the flood tide the safest course is to give Gull Lighthouse a berth of from ½ to 1½ mile, and then proceed as before directed on page 127; or if bound to New London follow the suggestions given on page 133, taking care, however, not to bring Gull Lighthouse to the southward of W. by S. till New London light is in range with the highest steeple in the town, bearing North a little westerly; a W. by N. course will then carry you through the Race clear of the Valiant Rock. Passing through the Race between Valiant and Race Rocks, keep the highest point of Great Gull Island open south of the lighthouse, till New London Lighthouse is well open to the westward of the gap in Bolle's Hill, N. by W.;* keep it on this bearing until up with the harbour's mouth; or, if bound up the Sound, you may steer to the westward as soon as South Hammock appears northward of North Hill, on Fisher's Island. Should you be compelled to enter between Race Rock spindle and Fisher's Island, you must be careful to avoid a reef running off ¼ of a mile from the west point of that island, the edge of which, we believe, is usually marked by a buoy. When leaving the Sound for the eastward with the ebb tide, the reverse of these instructions will answer the same purpose.

The Gull Islands are two in number, of but small extent, are surrounded by a rocky reef, especially off their eastern and western extremities, and should, therefore, not be approached nearer than 3 or 4 cables' lengths. Upon the eastern and smaller island, on the south side of the main entrance to Long Island Sound, is a white lighthouse 56 feet high, showing a fixed light at the height of 74 feet above the mean level of the sea; a bell is struck every 10 seconds during foggy weather.

The channel between Gull Islands and Plum Island has a width of 1½ mile, and a depth of from 3¼ to 6 fathoms, but as there are several dangers in it, this passage is better avoided. In the middle of the channel there is a black rock named the *Old Silas*, close to the westward of which is a sunken ledge of 5 to 13 feet; and about ½ a mile S. by W. of the Old Silas is a reef named the Bedford, upon which there are 13 feet. To avoid the *Bedford Reef* keep Oyster Pond Point open of the south end of Plum Island, whilst the house on Plum Island is on with the northernmost of the two trees which appear beyond the house. There are several trees, but they appear, when seen from a distance, to be two only; or, keep within ⅓ and one mile from the west end of Great Gull Island, when running through. The stream of flood in this channel during the second and third quarters sets N.W., at a rate of from 1¾ to 2¼ miles an hour, but in its early part it runs N.W. by W. 1½ mile, and during the latter portion N. by W. ½ W. ¾

* This direction leads right athwart that of the tidal stream, and must be strictly adhered to, or you will risk the danger of being carried on to the Valiant Rock.

of a mile an hour; the ebb preserves nearly the same direction throughout, namely, S.E. by E. ½ E., running with a velocity of 2½ to 2¾ miles, except in its latter part, at which time its strength is only about ½ a mile an hour.

GARDINER'S BAY, formed by Long, Gardiner's, Shelter, and Plum Islands, is 7 miles in length and 6 in breadth, and, excepting on and near the shoals, from 4 to 6 and 8 fathoms in depth. There are three entrances to it, one on the south side of Gardiner's Island, one between the north end of Gardiner's Island and Plum Island, and the third between the west end of Plum Island and Oyster Pond Point. That on the south side of Gardiner's Island, as before stated, is so encumbered with shallow banks, and the channel among them, although 18 feet deep, is so narrow and winding as to be serviceable only to small craft under the guidance of local knowledge. The passage on the north side of Gardiner's Island has a width of 2 miles, with soundings of from 5 to 20 fathoms in it, but Bedford Reef and a rock nearly awash, ½ a mile off the south side of Plum Island, will have to be avoided, for which purpose it is advisable to keep nearer Gardiner's Point Lighthouse than to Gull or Plum Islands, giving the former a berth of from ¾ to 1½ mile in rounding it. In the passage between the west end of Plum Island and Oyster Pond Point, named *Plum Gut*, there is a good depth of water, so that it is frequently used by vessels bound to the western part of Long Island Sound; in this passage there is, on the west side of the channel, a rock, on which some years since the ship Loire struck; but it is so very small, that it is difficult to strike soundings on it; it is nearer to the reef extending from Oyster Point Pond than to Plum Island, but its position is now pointed out by an iron beacon, composed of a centre shaft inserted in the rock, rising 26 feet above low water, and surmounted by an iron cage-work in the form of an inverted pyramidal frustrum; there is also another rock, having 24 feet over it, about 400 yards from the rocky or bluff point of Plum Island, on which the lighthouse stands.

In Gardiner's Bay, on the west side of Gardiner's Island, there is excellent anchorage in 4 to 8 fathoms, well protected by the island from easterly winds, and by Shelter and Plum Islands from westerly and northerly winds. And good anchorage may also be had on the south-west side of the island in about 4 fathoms, on the southern side of Crow Shoal. You may anchor off the north-east shore of Gardiner's Island, during westerly winds, by bringing the high land of Plum Island N.W., and Eastern Plain Point of Gardiner's Island in sight, bearing from S. by W. to South. Here you will have 12 or 10 fathoms on a bottom of sand and mud.

On the south-east side of Plum Island is Plum Island Road, in which a vessel may anchor, with Mount Prospect, or the high white sandhills of Fisher's Island, touching the Gull Lighthouse, and bearing N. 62° E., and the N.E. part of Long Island in one with the S.E. end of Plum Island, bearing West; or the east bluff points of Gardiner's Island in one with the low beach extending from the north side of the island S. 45° E. With these marks you will be in from 7 to 8 fathoms, soft mud, quite out of the tide, and at not more than three-quarters of a mile from the shore of Plum Island, where there is very convenient and good water.

Gardiner's Island.—The nearest, Eastern Plain, point of this island lies about 10 miles to the westward of Montauk Point; the island is of a very irregular shape, for although 6 miles long there is no part more than about 1½ mile wide. The north extreme of the island, named Gardiner's Point, tapers to a point, and is low. About 200 yards within its extremity there is a brick-built house with a circular tower attached to the north end, and painted brown; this tower is 27 feet high, and shows a fixed light at an elevation of 29 feet above the mean level of the sea, visible 6 miles. A sandy flat, of 8 to 12 feet, surrounds the island, and runs off the shore in some places about ⅝ of a mile. On the west side of the island is a shoal, named the *Crow*, which lies about 1⅜ mile S.W. from the West Point of the island, and is connected thereto by a flat of 14 to 18 feet; this shoal has but 6 feet water on it, and may be avoided on its western side by keeping Great Gull Island just open north of Gardiner's Point lighthouse.

Plum Island.—This island lies to the south-westward of the Gull Islands, and is about 2½ miles in extent from east to west, and one mile broad in its widest part, which is at its western end. On the west end of the island, and on the east side of Plum Gut, there is a lighthouse, 34 feet high, which shows a light revolving once in every 30 seconds at 63 feet above the sea, visible 12 miles.

Along the south-east side of Plum Island there is a sandy flat of 8 to 12 feet water, upon the edge of which there is a rock nearly awash at low water. There are 12 feet inside this rock, and 3½ fathoms close-to outside. To avoid it, go not into less than 6

fathoms, when approaching the east side of the island. The northern shore of the island should have a berth of at least ⅓ a mile, as there are a 6 and a 9-feet rock lying off the middle of that side, with deep water close-to.

DIRECTIONS.—In the daytime, if bound to Gardiner's Bay, and having rounded Montauk Point, steer N. by W. ½ W., until you clearly discover the points that form Fort Pond Bay, and see the red cliff, on the western point, open of Culloden Point, or the eastern point. You may then steer W. by N., for the channel between Gardiner's Island and Plum Island, passing between the Shagwong and Cerberus Reefs. Having made Gardiner's Island you may round its northern low point, only taking care not to approach it nearer than ½ a mile, on account of the 12 to 15 feet shoal which runs off it. New London Lighthouse kept a sail's breadth open to the eastward of Plum Island will carry you up into the middle of Gardiner's Bay, in the deepest water, and out of the tide, where you may anchor at pleasure in from 5 to 8 fathoms.

Or, you may also reach Gardiner's Bay by attending to the following instructions:—Being three-quarters of a mile to the eastward of Montauk Point, in 5 to 6 fathoms, steer N. ¾ E., 1½ mile, when you get into 7 fathoms, gravelly bottom, with Montauk Point bearing S.W. by S., distant 2 miles. Steer now N.W. ½ W., 4½ miles, until Montauk Light bears S.E. by S. ½ S., 5⅓ miles, when you will be in 14 or 16 fathoms, grey sand and gravel. Then haul in W. by N. ½ N., until Plum Island Light is in sight, then run for it on this course until Little Gull Island Light bears N.E. Run in with it on that bearing until Plum Island Light bears N.W., then haul in to the S.S.E., and anchor in from 3½ to 4½ fathoms, muddy bottom.

On rounding Montauk Point in the night, when the land or light can be seen, and during a westerly gale, you may anchor when the light bears S.W. by S., in 8 or 9 fathoms, coarse sand. Having brought Montauk Point to the southward of West, when the weather is thick, and you cannot clearly ascertain the distance from the point, the lead must be your guide. Steer as high as W.N.W. until you have gained 9 fathoms, then haul off into 13; and if you suddenly shoalen from 10 to 6, steer off E. by N. until you gain 11 or 12, when the lead, kept well going, will prevent your going too near the reefs.

To go through *Plum Gut* to the westward, give Pine Point, the south point of Plum Island, which is moderately steep, a berth of 2½ cables' lengths, and steer so as to bring the west bluff of Plum Island to bear N. by W. Keep it on that bearing until you have brought the poplar-tree clear of the east end of Mr. Jerome's house, or until you have brought Pine Point to the southward of East; you will then observe a wood, close inland of the high bluff of Long Island, which, when bearing W. ½ S., will be in one with the rocky point, which is the next point to Oyster Pond Point. Steering with the wood and this point in one, will carry you clear of the reef lying off the north bluff.

In running through the Plum Gut to the eastward, keep the point over the middle of the wood before mentioned, until the poplar tree is to the west end of the house; then steer to the southward, giving Pine Point a berth as before. Pine Point bearing E. by S. will lead clear of the shoals coming to the eastward. The tide runs 4 or 5 knots in the gut. The flood sets about W.N.W., and the ebb E.S.E. It is high water at 9h. 38m. on the days of full and change.

SAG HARBOUR is in the south-west corner of Gardiner's Bay, on the south side of Shelter Island. Extensive sand-banks bar the approach to it, over which, we believe, from 12 to 15 feet water can be carried, but the channel up to Sag is narrow and winding, and, though buoyed throughout, it is advisable to employ a pilot. When in, excellent shelter can be had in a moderate depth, and supplies of all descriptions can be obtained at the village. About one mile inside the bar, and on the port hand in entering, is Cedar Island, with a white building on it, used as a keeper's dwelling, on the top of which a small fixed light is exhibited, at the height of 34 feet, visible to the distance of 10 miles.

Coming into Gardiner's Bay, between Plum and Gardiner's Islands, and having brought New London Lighthouse a sail's breadth open eastward of Plum Island, you may proceed on that bearing up the middle of the bay to the outer edge of Sag Harbour bar. Or, when Gardiner's Point light bears South, distant 1 or 1⅓ mile, a S.W. ½ S. course for 7¼ miles will answer the same purpose. Entering through Plum Gut and from abreast of Pine Point a S. by W. ½ W. course for 6 miles will likewise lead up to the entrance of the harbour. The direction of the channel over the bar is W.S.W. up to Cedar Island light.

GREENPORT is situated on the Long Island shore, opposite the north end of Shelter Island, and the channel to it, which leads in from Gardiner's Bay, between Ram's Head and Long Beach Point, has a depth of not less than 5 fathoms, and is marked by buoys, but as the encroachment of the sand-banks extending from both shores contracts it to very narrow limits, large vessels especially should take a pilot. In running for this place, from the entrance of Plum Gut, steer S.W. 4⅓ miles, which will bring you up to the buoy at the entrance of the channel. Long Beach is 3½ miles long, and covered with low cedar trees, which you leave on your starboard hand going up to Greenport. You will have, from Plum Gut to the entrance, on this course, from 7 to 4½ fathoms of water, and in tacking towards Long Beach you will shoal your water to 3 fathoms, and if you get any less, haul to the southward. From the entrance your course is W.N.W. ½ W., 1½ mile, which will carry you to the elbow of the bank off Long Beach Point in from 4 to 10 fathoms; steer now N.W. ½ N. for nearly a mile, and then about West, a similar distance to Hay Beach Point, on Shelter Island, which you leave on your port hand; haul close round Hay Beach Point, and your course is S.W., one mile, to Greenport; then you may come to anchor in a good harbour.

From the middle of the channel off Gardiner's Point to Greenport the distance is 6½ miles, on a S.W. by W. ½ W. course. Sailing on in this course you will shoal your water from 6 fathoms, gradually decreasing to 3 fathoms on the Long Beach side; and when up with the buoy at the entrance of the harbour, follow the above directions to Greenport.

On each side of Shelter Island there is a channel leading into Noyack, and Little and Great Peconic Bays, that on the northern side being the deepest. To go to either of these places a stranger must obtain the assistance of a pilot.

From the Race westward the first dangers requisite to be pointed out are the two rocks lying off the middle of the northern side of Plum Island; they have 6 and 9 feet over them, and may be cleared by giving the island a berth of at least ½ a mile. Passing the entrance of Plum Gut, and distant about 5 miles westward from the flashing light on the west end of Plum Island, the coast makes a short curve, forming a small bay, fronting which and distant nearly ¾ of a mile from its head, is a bank with only 6 feet least water over it, with from 4 to 8 fathoms all round; to avoid this, Terry and Rocky Points, the east and west points of the little bay, should have a good offing given them, say, of ¾ of a mile or more.

Horton Point, above 6 miles further westward, has a red brick tower upon it 30 feet high, from which a fixed light is exhibited at an elevation of 110 feet above the mean level of the sea, and visible to the distance of 18 miles in clear weather. Here commences a sand-bank which runs westward and parallel to the coast to beyond Duck Pond Point, a distance of 6 miles, its outer edge, near the middle, being about one mile from high-water mark; upon its eastern part the soundings over it vary from 3 to 9 feet, and on its western from 9 to 12 feet, and as there is deep water of from 5 to 10 fathoms close-to its outer edge, great care should be exercised when tacking towards the land hereabout; the depth of 12 fathoms, if preserved, will lead clear of it, or Horton light kept to the eastward of E. by N. will serve the same object. At Duck Pond Point the bank begins to close with the shore, and for 3½ miles westward does not extend from it more than ⅓ of a mile, but at Jacob's Point its 3-fathom edge curves out to above ¾ of a mile off the coast, then recedes, and off Roanoke Point again runs out to seaward above 1½ mile, and has here near its extremity only 12 and 15 feet, which deepens immediately to 18 and 19 fathoms. This part is, therefore, very dangerous, particularly in thick or hazy weather. From the 12-feet spot Horton light bears E. by N. ⅓ N. distant 12⅓ miles, and Faulkner's Island light N. by E. ½ E., also 12⅓ miles. Consequently, as soon as Falkner's light comes to the eastward of N. by E., that on Horton Point should be maintained on a bearing more easterly than E. by N., and a W. by N. course steered towards the lightvessel off the south end of the Middle Ground, which will carry you clear of another prolongation of the bank from Herod's Point, about 5 miles westward of that from the point of Roanoke, on the edge of which, at nearly 1½ mile off the point, there are but 6 and 14 feet, and 17 fathoms at a short distance outside. Hence to the Old Sow Rocks the edge of the bank in 3-fathoms is not more than ¾ of a mile from shore, but it shoalens very rapidly to 9 and 6 feet. The Old Sow Rocks are situate 7½ miles eastward of Old Field Point lighthouse, and here the land should have a berth of 1½ mile or more, as there are only 3 fathoms at 1¼ mile from it, which soon decreases to 12 and 9 feet as the beach is approached.

Mount Misery Shoal is another and the last projection of this bank which fronts the

coast all the way from Horton to Old Field Point; it is 1¾ mile E. ½ N. from Old Field Point, and ¾ of a mile northward of Mount Misery Point, has but 6 feet water over it, is steep-to, the outer edge being marked by a buoy, and between it and the latter point are soundings of 3, 2½ and 2 fathoms. Mount Misery Shoal forms the southern, and Middle Ground the northern side of the channel most frequently used by vessels passing up and down Long Island Sound, and by the exercise of mere ordinary care and the aid afforded by the lightship off the south point of that ground, and the lighthouse on Old Field Point, they may sail through it clear of both these dangers.

Old Field Point is nearly opposite Stratford Point, and 31 miles westward of Horton Point. The white lighthouse upon it shows a fixed light at the height of 67 feet above the mean level of the sea, visible 13 miles. Eastward of Old Field Point, between it and Mount Misery Shoal, is the entrance to Setauket Bay, wherein are the villages of *Port Jefferson* and *Setauket;* but as the channel over the bar is both shallow and intricate, none but very small vessels under the control of persons acquainted with the bay can reach either of these places.

Smithtown Bay.—The extremity of Crane Neck Point is 2 miles westward of Old Field Point. Here the coast runs in 2¼ miles to the southward to the entrance of Stony Brook Harbour, the bar of which is shallow and can only be crossed in safety by the aid of a pilot. The bars of Nissequaque River lie 4 miles W. by S. from that of Stony Brook, the intervening coast being fronted by a broad and shallow flat; within the river's mouth are the villages of Nissequaque and Darlington, to which small craft ascend under the guidance of local knowledge. Hence to Eaton's Neck Point the coast trends N.W. by W. ½ W. 7½ miles, and should not be approached nearer than one mile, for a flat of hard sand extends off to nearly that distance in several places. Crane Neck and Eaton's Points are the east and west extremities of Smithtown Bay, distant 11 miles from each other; they should have a good berth in passing, especially the latter point, and when between them, if the depths are not reduced below 10 and 9 fathoms, you will be clear of the flats lining the shores of the bay.

HUNTINGDON BAY runs in 2 miles to the southward, between Eaton's and Lloyd's Necks, is above a mile in width, and in the fairway there are soundings of 5 and 6, decreasing as you advance inwards to 4 and 3 fathoms. Good anchorage may be had in any part, except with northerly winds. Its shores are lined with sandy flats, and should have a berth given them by large vessels when seeking shelter in it. In the south-east corner of the bay there is a narrow channel, about 60 fathoms in width and 3 and 4 fathoms deep, leading in between the sand-bank extending southward from East Beach Point and that fronting the mainland, into Cow Harbour, or Northport Bay, wherein are from 9 to 4 fathoms gradually shoaling as you proceed eastward round Little Neck Point towards the village of Northport, where there are only 4, 5, and 6 feet water, or southward into Centreport Inlet, which has but 3 and 2 feet in its narrow and winding channel. In the south-west corner of the bay are the entrances of two shallow inlets; that running in southward, and named Huntingdon Harbour, has 10, 8, and 6 feet in it, but the channel-way is not more than 50 fathoms in width; and that running in westward, named Lloyd's Harbour, is much frequented by coasters, and may be entered by bringing the point of West Beach to bear West or W. ½ N.,* stand in on that direction keeping the point close aboard, and anchor when within it, in 10 feet, or haul in directly round it and lie in soft mud at low water perfectly sheltered from all quarters.

High water on the days of full and change at 11h.; spring tides range 9⅙, and neaps 6⅙ feet.

On Eaton's Neck Point, the eastern side of the entrance to Huntingdon Bay, there is a white lighthouse 56 feet high, showing a fixed light at an elevation of 138 feet above the sea, visible 17 miles in clear weather. From the shore of the lighthouse a reef stretches out 4 cables' lengths north-eastward, with as little as 2 feet of water on its outer part, the extremity of which is marked by a buoy moored in 13 or 14 feet; from this spot shoal water of 16 and 18 feet extends nearly ¾ of a mile further in a N.N. westerly direction, the northern end being also pointed out by a buoy; and ½ a mile still further north-westward, with from 4 to 7 fathoms between, lies a small rocky patch of 19 feet, with the lighthouse bearing from it S. by E. ¼ E., distant 1½ mile;

* Upon West Beach, and just within the extremity of this point, is a brick-built tower 34 feet high, which exhibits a fixed light 48 feet above the mean level of the sea, visible 10 miles, and is of much service to vessels seeking refuge in *Lloyd's Harbour* in the night time.

this has likewise a buoy on its northern side. Therefore, large vessels in passing should keep at above 2 miles from this point, and those entering Huntingdon Bay from the eastward should exercise great care either in rounding these dangers or in going through between them.

OYSTER OR SYOSSET BAY is separated from Huntingdon Bay by Lloyd's Neck; its entrance lies between Lloyd's Point and the reef extending $\frac{3}{4}$ of a mile northward from Hog Island, which forms the western side of the bay. As a spit runs three-fourths the distance over from Hog Island towards Lloyd's Neck, the channel, which is thereby confined to the eastern side of the bay, is only $1\frac{1}{2}$ cable wide, that is, from 3 fathoms on one side to 3 fathoms on the other, though the depth varies from 4 to 10 fathoms, but when inside the spit there is plenty of room and a good depth of water, which shoalens very gradually as you proceed southward up Cold Spring Harbour. In this harbour from 14 to 17 feet over a soft bottom will be found to within 100 or 150 fathoms of either shore, but it is quite exposed to northerly winds, whereas Oyster Bay Harbour, an arm of the bay running in to the south-westward, forms a spacious and safe retreat from all winds, with good anchorage in $7\frac{1}{2}$ or 8 fathoms, soft sticky bottom; smaller vessels may go further in and anchor in what depth they please. It is high water on full and change days of the moon at 11h. 5m.; springs range $9\frac{1}{2}$ feet, and neaps $5\frac{1}{4}$.

Entering from the eastward, be careful to give Loyd's Point a berth of $\frac{1}{3}$ a mile or more, to avoid Morris Rock and the flat surrounding the point, the north-east edge of which is marked by a buoy. When this point is rounded the eastern shore of the bay may be followed to within two cables' lengths. From Centre Island Point, the western point of entrance, a reef, named Hog Island, or Centre Island Reef, juts out N.N. Westward $\frac{3}{4}$ of a mile, and has a buoy on its extremity, and for 3 or 4 cables further northward there are not more than 15 or 18 feet, deepening afterwards to 5 and 6 fathoms. Also, as before stated, from the eastern shore of Hog Island, a spit of from 5 to 7 feet water over a hard bottom makes nearly across the bay, to avoid which you must keep the eastern shore close aboard until you have fairly opened the mouth of Oyster Bay Harbour, when it will bear about S.W. by W.; run into this harbour, keeping rather nearer the northern point of entrance than the southern, to avoid the rocks and shoal which extend nearly half-way over from the latter; haul up south-westward in mid-channel, and anchor when well within the entrance in 7 or 8 fathoms, soft sticky bottom.

At Oak Neck Point, the next westward of Hog Island Reef, commences a broad flat, which continues along the coast thence to Matinicock Point, the eastern point of entrance of Hempstead Bay, where its extremity is marked by a buoy.

HEMPSTEAD BAY is $6\frac{1}{2}$ miles westward of Oyster Bay, and runs in nearly 5 miles in a southerly direction, gradually narrowing and shoaling as you proceed towards the village of Hempstead or Roslyn at its head. Being quite open to the northward it affords no shelter from wind or sea from that direction, except to such small vessels as are capable of entering Mosquito Cove on the eastern shore, or Hempstead Harbour in its upper part. In the outer part of the bay the depths are 4 or 5 fathoms, near the middle 3 and $2\frac{1}{2}$, and just before you enter the latter harbour 4 and 3 fathoms. When sailing in give both shores a moderate berth, and bring-to where convenient. Near the eastern shore there is excellent anchorage.

Sand's Point, &c.—Prospect Point may be considered as the western point of Hempstead Bay; it may be known by a remarkable rock on the shore, named the Pulpit, which, while it bears between S.E., southward, and S.W. by S., should not be approached nearer than to have Sand's Point light bearing S.W. or S.W. by S., so as to avoid the Old Hen Rock, and the shallow ground surrounding it and the point. Sand's Point lighthouse is $\frac{3}{3}$ of a mile westward of Prospect Point, and exhibits a light flashing once every half-minute, at an elevation of 53 feet, visible 15 miles. When off this point you should make but short tacks on account of the Execution Rocks, and also on account of the rocks which surround Sand's Point and the adjacent coast.

The Execution Rocks occupy a position right in the fairway of the sound, and extend N.E. by N. and S.W. by S. about a mile, and are $\frac{1}{4}$ of a mile across in the broadest part, where the lighthouse is placed, near the middle of the reef. The light is a fixed white light, and being 54 feet above the sea, may be seen at a distance of 12 miles in a clear atmosphere. Here there is a bell rung by machinery in foggy weather. From this light that on Sand's Point bears S. by E. $\frac{1}{2}$ E. nearly a mile. On each end of these rocks a buoy is placed, which, with the lighthouse, ought to guard vessels from running on them.

From a position midway between Sand's Point and Execution lights your course is S.W. 2¼ miles for the south end of Hart Island, leaving the buoy off Sand's Point and the Gangway and Success Rocks, which we believe are marked by buoys, on your port hand. These rocks lie opposite the middle of Hart Island, and ⅞ of a mile south-westward of Sand's Point lighthouse, the former, which is the outermost, having but 6 feet over it, and lying right in mid-channel. The south point of Hart Island has, or had, two single trees on it, and is bold-to.

HART AND CITY ISLANDS.—At about 2 miles to the south-westward of the light-house on Execution Rocks is Hart Island, under which there is good anchorage with either easterly or westerly winds. To anchor on the east side you may stand towards a barn which is in the bend towards the south part of the island and anchor in 3 fathoms, the trees bearing S.S.W., distant half a mile. Should you wish to anchor on the west side of Hart Island, between it and City Island, you should haul close round the south point of Hart Island, or bring the point in the middle of Hart Island in range with the north-west point of the island, and stand in; when beating in, tack in 17 feet on the west side, and in 18 feet on the east; anchor with the middle of the island bearing east. High water on the days of full and change at 11h. 20m.; springs rise 8½, neaps 7¼ feet.

Hence to Throg's Point the course and distance are S.S.W. 2½ miles, passing the buoy on the end of the Stepping Stones Reef on your port hand, and stand over to the western side into 3 fathoms, being guided by the lead. Should the buoy on the Stepping Stones have drifted from its position, take care, when about half-way towards Throg's Point, not to bring the south point of Hart Island northward of N.N.E. At the extremity of Stepping Stones Reef the flood runs S.W. by S. about ½ a mile an hour, and the ebb in a contrary direction, not quite one mile. Give Throg's Point a berth of 2 cables' lengths when rounding it, and steer W. by N. towards White-stone Point.

Throg's Point light is fixed and shown at the height of 66 feet, from the north-east side of Fort Schuyler, visible 10 miles in clear weather; a bell is struck by machinery seven times per minute in foggy weather, which should be heard from 1 to 1½ mile off.

EAST RIVER.—From Throg's Point westward vessels should maintain a mid-channel course, for from the eastern point of Flushing Bay, a deep inlet on the port hand, a reef, named Lawrence, extends nearly one-third the channel over, but this, as well as the other prominent dangers in this passage, has a buoy on its extremity. Keep along by the main or northern shore, and pass round to the northward of Riker's Island and the North Brother, and when between Lawrence Point and Marsh Island (a sunken meadow) you will cross over the Middle Ground, whereon are soundings of 20, 21, and 22 feet, rocky bottom, but deeper water nearer the island. Still continue in mid-channel up to the south point (Negro Point) of Ward's Island; you will now have arrived at *Hell Gate*,* and very great care will have to be exercised to go clear of the many rocks and shoals which are here scattered about. S.W. 250 yards from Negro Point, and W.N.W. 400 yards from Woolsey's Bath House on the Long Island shore, lies the *Pot Rock*, over which, we believe, there is now not less than 18 feet; the usual passage is to the northward of this rock,† and to the southward of the Frying Pan (9-feet rock), which lies 280 yards N.W. ¾ W. from the Pot, and N.E. by N. 330 yards from Hallet's Point at Port Stevens. Between the Pot and Frying Pan, about 100 yards off the shore of Ward's Island, are two rocks, named Holmes and Hog's Back, which are connected and surrounded by a bank with from 2 to 6, 12, and 18 feet over it; the former should, therefore, have a berth of ½, and the latter a berth of ¾ of a cable's length. The River or Gate abreast of Fort Stevens is divided by rocks and reefs into three channels; the Eastern Channel, between the Fort Stevens shore and Flood and Gridiron Rocks; the Middle Channel, between the Negro Heads and the Great and Little Mill Rocks; and the Main Ship Channel, between the Mill Rocks and Rylander's Reef off Manhattan or New York Island. When to the southward of these channels Blackwell's, a long and narrow island, again divides the river into two passages, through

* Previous to entering Hell Gate, the anchors should be got ready for letting go, and cha ns ranged and stoppered at 10 or 12 fathoms.

† Southward and south-westward of the Pot Rock are two other rocks, the Way Reef and Sheldrake Rock, the former midway between the Pot and the shore, and the latter about 35 fathoms off the shore.

either of which vessels may pass, their choice of course depending upon circumstances, remembering that its southern end is prolonged for a considerable distance under water. Hence to the city wharves the dangers on both sides are buoyed, as are also Quince's, Prince's, and Diamond Rocks, between Governor's Island and the south end of the city, so that vessels passing out into New York Bay or Hudson River will perceive their position and be enabled to avoid them.

DIRECTIONS.—To sail through Hell Gate high water slack is the most convenient time, as the tide is favourable down to New York; there is, however, sufficient depth at low water for any ship in the Gate. Should the pilot have miscalculated the tide, and the ship, with a strong favourable tide and a leading breeze, be advanced near the Gate, you must attend the true set of the stream, in which you may easily keep the ship with lofty sails; low sails being liable to be becalmed by the land. The principal ebb-stream leads round the Great Mill Rock, which is very bold, whence it turns short to the southward by Flag-staff Point, or Horn's Hook, in the western Blackwell Island Channel. The passage between Great Mill Rock and the Negro Heads is deep, but very narrow. The southernmost passage, between Flood Rock and Long Island, is used on the flood only, when the stream leads fairly through.

The following directions for passing through *Hell Gate* are by Messrs. Potter and Davis, Lieuts. U.S.N.:—

"*Entering from the Northward with the ebb.*—The Main Ship Channel is the best at all times, as having deeper water and less current. Vessels must not give the Hog's Back too wide a berth, which might set them on Mill Reef (extending S.E. 130 yards from Great Mill Rock), or compel them to run the middle Channel. Always stand close to Negro Point, about 50 yards off.

With a fair wind.—Stand close to the Frying Pan ripple, and give Great Mill Rock a good berth to avoid the eddies which extend out 3 or 4 vessels' lengths; open the Little Mill Rock until Horn's Hook (the projecting point of Manhattan to the southwest) and Gallows Hill, on north end of Blackwell's Island, are nearly in range; steer for Bread and Cheese (the rocks extending from the N. point of Blackwell's Island) a little open on the starboard bow, this will bring a vessel into the Middle Channel tide; take the eastern side of Blackwell's Island when the wind is light, and to reach it, when abreast of Negro Head, steer for Hatter's Dock (on the shore eastward of and opposite Blackwell's North Point); if the tide is strong, take the western channel.

With the wind S.W., or dead a-head.—In entering the Gate, tack near Negro Point Bluff,* and stand towards Scaly Rock (on the opposite side), so as to tack again one vessel's length outside the eddy; the next tack will bring a vessel to windward of Negro Point; make a short tack, which will clear the eddies of Pot Rock; stand directly through Main Ship Channel over towards the meadows, keeping Horn's Hook and the white house on Gibb's Point† open; the next tack will fetch between Great Mill and Little Mill Rocks, on the edge of the eddies; tack with the Bread and Cheese and Gibb's Point in range, make a short tack, towards Rylander's Reef; tack again off Rylander's Reef, when a vessel, meeting the Middle Channel tide, will be forced up into the wind, the current drifting her to windward clear of all danger.

With a good breeze, vessels may pass through the Middle Channel, having 19 feet at low water, save two tacks, and avoid the danger of Rylander's Reef and eddies. After passing the Frying Pan, stand for the north end of Little Mill Rock, until within 60 yards of it, when steer for the south end and pass within 20 yards of it, tacking before Horn's Hook and the white house on Gibb's Point are in range.

Vessels passing through either the Main Ship Channel or Middle Channel, take the channel *west* of Blackwell's Island, the winds being more steady in that direction. Go pretty close to Horn's Hook, always avoiding the eddies. After passing Horn's Hook, keep as near the middle of the channel as possible, and never shut in one point of land with another.

Take the same course with a southerly wind, but with a northerly wind cross over to the *east* side of Blackwell's Island, giving the Bread and Cheese a wide berth. The greatest danger from the eddies of Bread and Cheese is on the ebb.

The Eastern Channel is only safe with the wind northward and westward, the line of true current being very narrow. Shave Hallet's Point very closely, and steer with Flood Rock open on the starboard bow, a vessel will apparently be setting upon the rock, but

* The only elevation on the east side of Ward's Island.

† Gibb's Point, Long Island, is southward of the north point of Blackwell's Island.

when her bow gets within the influence of the true current, it will put her head directly through the channel. Vessels always get on the Gridiron from those on board not making up their mind in time which channel to take; in light winds, steer for Hallet's Point when abreast of Pot Rock; for the Main Ship Channel when abreast of the Frying Pan.

With the *flood tide* and a fair wind go either around Great Mill Rock or through the Middle Channel."

FROM NEW YORK NORTHWARDS.—There are two passages from New York Bay and Hudson River, one to the southward and eastward of Governor's Island, named Buttermilk Channel, in the middle of which is a shoal of 14 feet, and the other between Governor's Island and the south point of the city, which is the better of the two and the most used, although the three sunken rocks, Diamond,* Prince, and Quince, are great and dangerous obstructions to it; yet as they generally appear by the rippling of the tide, and are buoyed, they may with care be easily avoided. The tide during the last quarter ebb, sets from the North or Hudson's River around Fort Point, and flows up the East River, at the rate of 3 knots; whence, with a like velocity, it returns 2 hours before the North River at high-water time. This is a great convenience to ships in shifting their berth from one river to the other. Ships of war may, during the summer season, ride in either river, in the stream; in the winter they haul to, or moor between the wharves. When clear of the before-mentioned sunken rocks, keep as nearly as possible in mid-channel of East River, up to Blackwell's Island.

Blind Rock and Governor's Table Rock extend S.W. 600 fathoms, on a range from Blackwell Island. The channel on the west side of the island is clear, and throughout deep, a boat's length from the shores. There is a sunken rock two-thirds of the way up the channel, and about 30 fathoms from the starboard shore.

Before you enter into either of the Blackwell Island Channels, if flood, let the tide be nearly spent; if ebb-tide, endeavour, by stemming the stream, which continues swift until a quarter of an hour before the turn of the tide, to reach *Hell Gate* at low water slack, the most desirable time to get through. As you run up between Flood Rock, which is steep-to, and the point of Long Island, bear up more easterly, keeping the mid-channel. The least drain of tide will show the Hog's Back dangers on your port, and the Pot Rock on your starboard, by the uncommon ripple and boiling appearance of the water.

Lieuts. Porter and Davis, U.S.N., give the following instructions to vessels PASSING THROUGH HELL GATE FROM THE SOUTHWARD:—*Flood tide.*—"The channel east of Blackwell's Island is the best; vessels standing through the west channel run great danger of being carried by the current on to Middle Reef (extending north-west from Flood Rock). With a head wind, vessels may beat through Hell Gate, either by the East Channel, or with a commanding breeze, go round to the northward of Great Mill Rock. In the latter case, a stretch very near Hog's Back may be made with safety. With a fair wind, small vessels may keep in the East Channel, and in the main body of the current. Large vessels must go through the Main Ship Channel. In the Main Ship Channel, steer with the Great Mill Rock well open on the starboard bow, and stand past it far enough to avoid the eddies, which extend about 30 yards to the northward of the rock; steer then with the ripple of the Frying Pan one point on the port bow; after passing the Frying Pan, haul up for Negro Point, passing clear of it about 60 yards, then if a vessel keeps in the middle of the channel, the current will take her to the westward of the Middle Ground off Lawrence's Point.

In entering Hell Gate from the east side of Blackwell's Island, take the middle of the channel, avoiding the eddies about Bread and Cheese, and those about Hatter's Dock, which show very plainly; pass Astoria Ferry about 50 yards off (on the starboard hand), and steer for the centre of Flood Rock, this will put a vessel in the true flood tide when she is abreast Flood Rock. From Flood Rock steer for an old house on Ward's Island (then bearing about N.E. ¼ E.) with poplar trees in front of it, until nearly up with the ripple of the Frying Pan, when haul up or keep away for Negro Point, and proceed as before directed.

Approaching Hell Gate through the west channel of Blackwell's Island, do not attempt

* We believe that some attempts have been and are still to be made to remove this rock, which has so often injured or entirely disabled those vessels which have been forced upon it through the quantity of shipping or barges constantly passing to and from the East River, and thus blocking up the fairway.

to pass over to the Eastern Channel, unless the wind is fair and fresh, then stand across past Flood Rock until the old white building on Ward's Island opens to the right of it, when proceed as before directed.

With a light wind from the westward a vessel is at the mercy of the current, and her only chance to avoid being drifted over on Cram's Bank (south-east of and opposite Negro Point), is to hug the Frying Pan, passing only one length to the southward of it, and tack in towards Negro Point when it bears North, stand on only long enough to get headway on the vessel, tack again and keep the mid-channel.

Entering Hell Gate (with no prospect of wind), anchor in Hallet's Cove* (south-eastward of Blackwell's North Point) to the northward of Thornburn's Dock, taking care not to let go the anchor with any headway on, as the ground is very rocky, and many anchors are lost at this place. In getting under way from Hallet's Cove, stand out due West from Thornburn's; vessels frequently stand too near Hatter's Dock, when they invariably strike on Bald Headed Billy, a round smooth rock dry at low water. In case a vessel is caught in the eddies of Bread and Cheese, the only chance of avoiding the rocks is to stand through between Bread and Cheese and Blackwell's Point, a good 7-feet channel at low water, and about 50 yards wide.

When, owing to light westerly or N.E. winds, vessels are drifted within the influence of the Pot eddies, they must inevitably go over on Cram's Bank and get on shore to the north of Woolsey's Bath House: to avoid this run into Pot Cove† and anchor; the current turns into Pot Cove opposite Woolsey's Bath House, and will enable a vessel to reach good anchorage.

Slackwater.—With a fair wind, take the East Channel. With a head wind, allow room for tacking when near Flood Rock, as a slight under-current often makes vessels miss stays, when they go upon the Gridiron. The longest tacks can be made by going to the northward of Great Mill Rock, but a vessel this way is in danger of losing the slack water, which never lasts more than 10 minutes, and generally not more than 6 minutes.

Ebb tide.—With a fair wind, keep along the shore near Hallet's Point to avoid the strength of the currents; but after passing this point, keep mid-channel to avoid the rocks off the southern extremity of Ward's Island. Unless the wind, however, is very fresh, it is not advisable to attempt to pass through Hell Gate from the southward after the ebb tide has been running 20 minutes. Abreast of Hallet's Point, vessels meet the strong current which sets them back over on the Gridiron, and they must either go on shore or anchor at great risk."

From Hell Gate to Throg's Neck the middle of the channel should be preserved, passing over the Middle Ground between Marsh Island and Lawrence's Point, before mentioned, and keeping along by the northern shore, leaving the North Brother and Ricker's Island on the starboard hand. The deepest water over the Middle Ground is near Marsh Island; it has only 20 feet over its shallowest part, which is right in the fairway.

TIDES.—There is a difference in the tides and tidal currents between Governor's Island and Negro Point (Ward's Island), at the eastern entrance to Hell Gate, of about 2¾ hours. Between this point and Throg's Neck, near which the easterly and westerly currents meet, the change is small. Hence through Long Island Sound, see "Tides," page 129.

At *Hell Gate* it is high water on the full and change days of the moon at 10h. 10m.; springs range 6½, neaps 4¼ feet. At *Throg's Neck* at 11h. 20m.; springs range 9¼, and neaps 6 feet. And at *New York* (Governor's Island) at 8h. 19m.; springs range 5⅔, and neaps 3⅔ feet.

The main body of both tides passes on the east side of Ward's Island; off Negro Point Bluff the change from ebb to flood takes place suddenly. With the ebb, which runs to the westward, the tidal current passes close to Pot Rock; the slack water lasts only a few minutes. South-eastward of the Flood Rock the current of ebb, which is deflected from Hallet's Point, and recoiling from the Gridiron, makes numerous eddies affecting its velocity; its force is lost in the whirls, but the westward motion of the main body is uniform; its greatest velocity is very close to Flood Rock—too close for a vessel to lie safely. Between Great Mill Rock and Ward's Island the ebb current runs a direct course, but that of the flood has numerous, though not violent eddies; the direction of

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* The middle of Hallet's Cove is occupied by a rocky patch of 135 yards in extent, with only 11 and 12 feet water over it.

† In doing so remember the position and depth over the Sheldrake and Way Rocks.

the ebb from Pot Rocks is on to the Gridiron; the current of the flood tide is very weak, the main stream passing to the southward of the Flood Rock. Off the edge of Rylander's Reef the slack water lasts 20 minutes, the flood tide is very weak, and the eddies frequent; the ebb is both direct and strong. In the Middle Channel of Hell Gate the current of ebb is broad and rapid, with numerous eddies. In the channels of Blackwell's Island, the currents of both flood and ebb are strong and direct.

LONG ISLAND (SOUTH SIDE) AND NEW YORK.

LONG ISLAND is by far the largest island on the Atlantic coast of the United States, as it is fully 100 miles long from the Narrows of New York to Montauk Point, its eastern extremity, and has a breadth of about 20 miles in its widest part. The island is low and level, with the exception of a rocky ridge, 200 or 300 feet high, which traverses it from west to east; Hempstead Hill is the highest of this ridge, being 320 feet above the sea. The south side of the island is low and flat, with several bays formed by low sandy islands; of these the chief are Great West, or Shinnecock Bay, and Great South Bay; this latter is separated from the sea by the narrow islet named Smith's Island, which, with the small island to the west, forms a channel named Fire Island Inlet. Hempstead and Jamaica Bays are further to the westward, at the entrance of the Bay of New York. The latter is rather extensive, and is covered with numerous low marshy islands.

It has been observed that the coast of the United States, from Long Island southward to Cape Florida, presents to the eye of the mariner a low level of sand covered with forests, and extending as far as the eye can reach. It is, however, indented here and there with deep bays and harbours, both capacious and accessible. North and east of Long Island the coast becomes high, and the shore more bold, and good harbours are more numerous. This circumstance has, no doubt, had its effect in determining the maritime character of that part of the Union.

MONTAUK POINT, the eastern extremity of Long Island, is composed of cliffs about 80 feet high, over which is a white stone lighthouse also 80 feet high, showing a fixed light varied by a flash once in every two minutes, at the height of 160 feet above the mean level of the sea. During the ordinary state of the atmosphere, the fixed light, between the intervals of flashes, may be seen at the distance of 20 miles, and the flashes from 3 to 5 miles further. The keeper's dwelling, built on the hill adjoining the tower, is painted brown. A strand of 6 to 18 feet surrounds the point, and extends off it and the coast to the north-westward, about half a mile, but to the southward and westward to not more than one-third of a mile; close to its edge are from 4 to 10 fathoms, bottom sand and specks.

Montauk Shoal lies 2¾ miles S. by E. from the lighthouse, is small, and has from 4 to 5 fathoms over it, bottom of hard sand. It is plainly shown by the tide rips, and the sea breaks upon it in heavy gales from seaward. Between this shoal and the point there are from 6½ to 12 fathoms, and from 6 to 12 close-to all round it.

SHINNECOCK BAY.—From Montauk Point the coast runs W. by S. ½ S., 33½ miles to a narrow opening forming the entrance to Shinnecock Bay, and is throughout clear of outlying dangers, the soundings shoaling gradually towards low-water mark, which is nowhere more than half a mile off that of high-water. The entrance to Shinnecock Bay is too shallow to admit anything but the smallest craft. About 1¼ mile inside, and on a projecting point of the northern shore of the bay, named Ponquogue Point, stands a brick-built tower 155 feet high, from which a fixed light is exhibited at the height of 164 feet above the mean level of the sea, visible from the distance of about 20 miles. This light is situate nearly half-way between Montauk and Fire Island Lights.

FIRE ISLAND INLET.—From Shinnecock Bay westward the character and direction of the coast is similar to the foregoing all the way to Fire Island Inlet, a distance of 35 miles. Fire Island Inlet, leading into Great South Bay, will admit small vessels, as at present (1851) there are 10 to 17 feet in the channel at low-water spring tides; but the passage is narrow and intricate, so that none but those well acquainted ought to attempt to run in. High water on the days of full and change of the moon at 7h. 18m.; range of springs 2½, and of neaps 1¾ feet. The bar extends about a mile from the land, and

outside it the water suddenly deepens to 4 and 8 fathoms, besides which the current here sets strongly, so that it is not safe to approach the coast nearer than 2 miles, especially when the lighthouse on the east side of the entrance bears to the eastward of North; on the whole, a ship ought to keep in at least 11 fathoms, the further out the better.

The lighthouse, on the eastern side of the entrance, is 150 feet high, built of yellow brick, and shows a light flashing once every minute, at the height of 166 feet above the mean level of the sea, visible in ordinary weather at the distance of about 22 miles.

From Fire Island Inlet the coast of Long Island, as far as the western point, trends nearly West, and is composed of narrow islets, forming with the main shore of the island shallow lakes, bearing the names of South Oyster, Hempstead, and Jamaica Bays. The inlets into these lakes, called Oak Island, Gilgo, New and Hog Island Inlets, are all shallow, except New Inlet, having but very little water, so that they are not available for even small vessels. New Inlet has from 8 to 10 feet over its bar. The three-fathom edge of their bars extends out from ½ to 1 mile from the general line of coast, for which due allowance should be made when in their vicinity.

Rockaway Inlet, leading into Jamaica Bay, is 9 miles north-eastward from Sandy Hook Lighthouse; it has a bar that often changes, and extends out from the coast about 2 miles, its outer edge being steep-to, the soundings immediately off it varying from 4½ to 6 fathoms. At present (1857) the channel is very narrow, with a depth of 12 feet on the bar, and great portions of the sands on both sides dry at low water.

NEW YORK BAY AND HARBOUR.—Generally speaking, New York Bay is formed by the shores of New Jersey, including Sandy Hook and Staten Island, on the south and west, and by the west end of Long Island on the east side. Its entrance, which is open to the eastward, is 6 miles wide, between Long Island and Sandy Hook, but a free ingress and egress is prevented by an extensive accumulation of sand, forming banks whereon are only a few feet of water, and, in some places, patches which dry at low tide. The navigation is, therefore, confined to the several channels in and among these banks, the principal of which are Gedney's, where the least depth is 23 feet; the North Channel, least water 21 feet; the South Channel, with not less than 22 feet; the False Hook Channel, which has 18 feet and upwards in it; Main Ship Channel, with 21 feet least water; the Swash Channel, through which 17 feet can be carried; the East Channel, wherein are 18 or 19 feet; and the Fourteen Feet Channel. These, however, are so liable to a change both in direction and depth, that the aid of a pilot should always be obtained by a stranger. Within and to the northward, through the Narrows, and up to the city, there is plenty of water for the largest vessels. That portion of New York Outer or Lower Bay immediately within Sandy Hook bears the name of Sandy Hook Bay; here the depths gradually decrease from 4 to 2½ fathoms, and the bottom consists principally of mud. The western part of the same, called Raritan Bay, is much shoaler, though a winding channel of 12 or 13 feet least water, leads through it up to the mouth of the Raritan River, Perth Amboy, and the southern entrance of Staten Island Sound, the narrow passage inside that island to Newark Bay and New York. New York Bay, proper, communicates by a narrow channel between Staten Island and Bergen Neck, named Kill Van Kull, with Elizabeth Port, at the northern end of Staten Island Sound, and, through the shallow bay of Newark, with Passaic River and the important town of Newark on its right bank; to which, however, only small vessels can go, as in the bay and river not more than 5 or 6 feet can be carried throughout. The bay is, likewise, in communication with the city of Albany, &c., by means of the Hudson River, which has a sufficient depth to allow large vessels to ascend to that place, and with Long Island Sound, through what is termed the East River, by which any sized vessel may proceed out to sea to the northward. (See pages 151 and 153.)

The city of New York is the largest, wealthiest, and most flourishing town in North America. It occupies the southern portion of Manhattan, a narrow island, 14 miles long, formed by the Hudson and the East River, and extends three miles along the bank of the former, and four along the bank of the latter river, at their junction with New York Inner Bay, which together form an excellent land-locked harbour, of easy access, sheltered from storms, deep enough for the largest ships, and sufficiently large to contain all the navies in the world. No city possesses greater advantages for

foreign commerce and inland trade; long lines of canals, with an elaborate system of railways, have increased its natural advantages, and, connecting it with the remotest west, have rendered it the great mart of a vast region, now occupied by a large population, while its facilities of communication with all parts of the world have made it the great thoroughfare of the continent. In 1650, it contained about 800 inhabitants; in 1700, 6000; in 1756, 10,831; in 1790, 33,131; in 1800, 60,489; in 1810, 96,373; in 1820, 123,706; in 1830, 202,589; in 1840, 312,710; in 1850, 515,647; and in 1860, 814,277.

In 1786 the whole shipping of the port did not exceed 120 in number, with a tonnage of 18,000. In 1836, it consisted of 2293 vessels, of which there were 599 ships, 197 barques, 1073 brigs and galleys, 412 schooners, and 4 sloops; with a burden of 350,000 tons. In 1791, the whole amount of the exports was £501,093; in 1816, only twenty-five years later, the mere duties on merchandise imported at New York alone amounted to £3,200,000; and in 1840, the value of the exports amounted to £6,146,304; and of imports to £15,053,603. The inland and coasting trade is immense; but of its actual extent and value there is no account. On the opposite shore of the Hudson stands Jersey City; and on Long Island is the city of Brooklyn, with a population of 36,233, in 1840; to the north-east of Brooklyn is Williamsburg, another suburb of the great emporium; and in Wallabout Bay, lying between these, is the United States' Navy yard. Several steam-boats at the ferries keep up a constant communication with New York, and a railroad runs eastward through Long Island to Hicksville, a distance of 27 miles. Several of the large Atlantic steamers sail regularly between it and Great Britain, France, and Holland. Ships of the largest burden may lie close to the quays of the city.

Lights.—*Sandy Hook lightvessel* is moored in 15 fathoms water, at 6¾ miles E. by S. from Sandy Hook lighthouse. It is painted red, has the name of the station in white letters on each side, and exhibits two fixed lights, each at the height of 45 feet, and visible at the distance of 10 miles. A fog-bell is rung and a fog-horn sounded in thick weather every alternate five minutes. Hence to the entrance buoy of Gedney's Channel the bearing and distance are N.W. ½ W. 4 miles, and to the South Channel W. by N. ¾ N. also 4 miles.

Highlands of Navesink Lights are situated on the main-land of Jersey, southward of Sandy Hook. They are two in number, the lighthouses being coloured white, each 40 feet high and 100 yards apart, and the lights, the northern of which is a fixed one, and the southern revolving once every half minute, being 248 feet above the level of the sea, may be seen in ordinary weather at the distances of 20 and 22 miles.

Sandy Hook Lighthouse, &c.—Sandy Hook lighthouse, coloured white and 77 feet high, is ¾ of a mile within the northern extremity of Sandy Hook, and 4 miles N. ½ W. from Navesink lights, and shows a fixed light at 90 feet above the sea, visible 15 miles in clear weather. A bell is struck by machinery seven times every minute in foggy weather. From the telegraph in its vicinity signals are made, announcing the arrival or departure of vessels, to New York.

There are also two smaller lights on Sandy Hook, named the East and West Beacons, the former of which is just within the north extreme of the Hook, and the latter half a mile more to the southward, and close to the inner shore; they are coloured white, and show fixed lights at a height of 35 feet, visible to the distance of 10 miles. The East Beacon is provided with a bell, and the West Beacon, when obscured by the screen, marks the outer edge of the bar, and when just clear northward of the main lighthouse it shows the turning point round the S.W. Spit in the Main Ship Channel.

Main Ship Channel Range Lights.—Two fixed lights, located on the New Jersey shore, westward of the Highlands of Navesink. The front one, which is 60 feet above the sea, is shown from a tower near the beach, painted with two white and one red horizontal bands, and the rear light is shown at a height of 224 feet, from the top of the keeper's dwelling, which is painted white, and is situated on the north side of Chapel Hill, 1¼ mile nearly S. by W. from the northern light. When in one they lead up the Main Ship Channel from the S.W. Spit to the Narrows, being visible in ordinary weather throughout the whole distance.

Gedney's Channel Range Lights are both fixed, and situated near Point Comfort, on the New Jersey shore, about 5 miles within Sandy Hook. The eastern or front

light is 40 feet high, and shown from the top of the keeper's dwelling, which stands near the beach, and is painted white. The inner or western light is 76 feet above the mean level of the sea, and exhibited from a white tower with a black top, $\frac{3}{4}$ of a mile nearly W. by S. from the former. During the day the rear light tower can be recognised by the lantern being projected on the sky above the trees. They are visible in clear weather outside the bar, and when in line lead in from the inner part of Gedney's Channel to where the Main Ship Channel Lights are brought in range.

Prince's Bay.—The white lighthouse on the west side of Prince's Bay and on the south side of Staten Island, is 33 feet high, and exhibits a fixed light varied by flashes every two minutes, at a height of 106 feet, visible to the distance of 16 miles. From Sandy Hook Lighthouse it bears W.N.W distant 10 miles. This light serves as a guide to vessels bound to Perth Amboy, Raritan River, or Staten Island Sound; and when seen on a W. by N. bearing, also as a guide up Gedney's Channel till the two lights at Point Comfort come in one, or till the Swash Channel Range Lights are in line.

Swash Channel Range Lights are erected on Staten Island, 7 miles north-westward of Sandy Hook. They are both fixed Lights and visible outside the bar. The tower of the front light has two white and one red horizontal bands painted on it, and the lantern is 59 feet above the mean level of the sea. The rear light is 189 feet high, and shown from a lantern on the top of the keeper's dwelling, which is situated on a hill near New Durp, $1\frac{1}{4}$ mile N.W. $\frac{1}{4}$ N. from the outer light, and is coloured white. These are sometimes named the Elm Tree Lights, and when in a line lead over the bar of the South Channel in not less than 18 feet at low water, and through the Swash Channel till the Main Ship Channel Lights are in one; or, if entering by Gedney's Channel with Prince's Bay Light W. by N., that course should be discontinued as soon as they come in one, and their direction followed.

Fort Tompkins Light, on Staten Island, is exhibited from a white building 46 feet high, a little southward of the Fort, and on the west side of the Narrows. It is fixed, and being elevated 89 feet above the sea, may be seen in ordinary weather at the distance of 15 miles.

Robin's Reef Light, in the S.W. part of New York Inner Bay, just above Tompkinsville, and on the west side of the channel up to the city, is shown from a white stone tower 51 feet high, and being elevated 66 feet above the mean level of the sea, may be seen at the distance of 13 miles. The passage into Kill Van Kull is southward of this lighthouse. When proceeding towards the Narrows with the Main Ship Channel Range Lights in line, that course should be discontinued as soon as this light bears N. by W., and the latter direction followed.* In foggy weather a bell is rung.

Bergen Point, at the inner part of Kill Van Kull, forming the east point of entrance of the shallow bay of Newark, has a reef of rocks extending $\frac{1}{4}$ of a mile south-westward from it, on which a white building is erected serving as the keeper's dwelling. On the top of this dwelling, and 40 feet above the water, there is a fixed light, visible 10 miles. Here also a fog bell is rung in thick weather.

Elizabeth Port.—A small fixed light is shown at Corner Stake opposite Elizabeth Port, at the northern end of Staten Island Sound.

Pasaic Lighthouse is intended as a guide to clear the mud flats on the western side of the channel up Newark Bay. It is $3\frac{1}{3}$ miles above Bergen Point, and rather more than a mile below the mouth of Pasaic River, and should be passed on its eastern side. The light, a fixed one, shown from a lantern on the top of a white building which serves as the keeper's dwelling, has an elevation of 40 feet, and may be seen at a distance of 10 miles. During foggy weather a bell is tolled.

The *Elbow Beacon* Light serves the same purpose as the former. It is a small fixed light, half a mile northward of the Pasaic Light, and should also be passed on its eastern side.

Buoys.—Throughout the harbour the shoals and channels are marked by buoys.

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* A shoal with 18 feet over it, bottom of sand and shells, lies one mile S.S.E. $\frac{1}{4}$ E. from Fort Tompkins Light, and with Robin's Reef Light N. $\frac{3}{4}$ W., so that the above bearing (N. by W.) should not be made too free with while to the southward of Fort Tompkins. The shoal is about 500 yards long from North to South, and 164 yards in breadth, and, we believe, is marked by a buoy, which should be left on the port hand.

Nun buoys mark Gedney's Channel and the Main Ship Channels to the city; *can buoys* mark the south channels of the bar and Swash Channel; and *spar buoys* the False Hook and East Channels.

On entering the channels from seaward the red buoys must be left on the starboard, and black buoys on the port hand. Buoys with red and black horizontal stripes mark obstructions, and may be passed on either side. Buoys with white and black perpendicular stripes will be found in mid-channel, and must be passed on either side close-to.

TIDES.—By observing the times of high and low water, it will be seen that they are very nearly the same all the way from Delaware River to Block Island and south of Nantucket; of course, not in the bays and harbours and up the rivers, but on the outer coast. Consequently, vessels bound to New York and making the land in the vicinity of either of these places, and in sailing thence in the customary routes towards Sandy Hook, they will have the same succession of tides, within some 15 minutes, as if they remained off these points. So that leaving, for example, at high water, they would have, according to the elapsed time, the ebb and flood alternating every 6¼ hours, as if they had anchored off these positions. As the flood tide sets in generally to the northward and on shore, and the ebb the contrary, they will know by the time that elapses from their departure, and the period of tide at which they started, what tidal currents they may expect to meet with as they approach New York.

The following particulars relative to the tides in New York Bay are the result of the observations made by the officers engaged in the United States Coast Survey.

High water on the days of full and change at *Sandy Hook* at 7h. 29m.

Rise of the highest tide observed above the plane of reference, May 30th, 1836, during a heavy gale from E.N.E.	8ft.	1in.
Height of mean low water, above the plane of reference	1	0
Height of mean high water, above the plane of reference	5	9.6
Mean rise and fall of tides	4	9.6
Mean rise and fall of spring tides	6	3.4
Mean rise and fall of neap tides	3	9.8

High water on the days of full and change at *Governor's Island* at 8h. 19m.

Rise of highest tide observed above the plane of reference, October 31st, 1837	7ft.	4in.
Height of mean low water, above the plane of reference	0	10.3
Height of mean high water, above the plane of reference	5	7
Mean rise and fall of tides	4	8.7
Mean rise and fall of spring tides	5	8
Mean rise and fall of neap tides	3	8.7

The mean duration of flood and ebb tides, reckoning from the middle of one slack-water to the middle of the next, from observations made in 1844, is—

At Sandy Hook	flood	5h.	59m.
"	ebb	6	1
"	slack-water at flood	0	22
"	slock-water at ebb	0	20
At Governor's Island	flood	5	57
"	ebb	6	17
"	slack-water at flood	0	29
"	slack-water at ebb	0	28

The following observations on the direction and force of the currents in the harbour and vicinity of New York were made in 1844, by Lieutenant Charles H. Davis, of the United States Navy. The rate is in miles per hour, the bearings those of the true compass, and the observations were made as much as possible when the influence of the wind was small:—

STATIONS.	1st Quarter.		2nd Quarter.		3rd Quarter.		Flood or Ebb.	
	Direction.	Rate.	Direction.	Rate.	Direction.	Rate.	Direction.	Rate.
2 miles E. of the North Channel	N. 88¼° E.	0.5	0 20° W.	0.9	N. 45½° W.	0.9	N. 45½° W.	0.5 Flood
	S. 68 E.	0.6	S. 54 E.	1.0	S. 41 E.	1.0	S. 41 E.	0.5 Ebb
3 miles S. of Duck Bar Island	N. 53½ W.	0.5	N. 41 W.	0.5	N. 31½ W.	0.5	N. 9½ W.	0.5 Flood
	East.	1.0	S. 58 E.	1.5	S. 42½ E.	1.5	S. 25½ E.	1.0 Ebb
In the North Channel	N. 87½ W.	1.0	N. 48½ W.	1.3	N. 74 W.	1.3	N. 67 W.	1.0 Flood
	S. 73 E.	1.2	S. 73 E.	2.5	S. 73 E.	2.5	S. 59 E.	1.2 Ebb
In the South Channel	N. 47 W.	1.0	N. 51 W.	1.5	N. 47 W.	1.5	N. 20½ W.	1.0 Flood
	S. 30 E.	1.2	S. 49 E.	2.3	S. 49 E.	2.5	S. 49 E.	1.2 Ebb
In Main Ship Channel	S. 61 W.	1.0	N. 83 W.	1.7	N. 52 W.	1.7	N. 43 W.	1.0 Flood
N. of Sandy Hook	N. 36 E.	1.5	N. 48 E.	1.5	N. 55 E.	1.5	N. 74 E.	1.3 Ebb
Half a mile W. of S.W. Spit	S. 38 W.	1.0	S. 87½ W.	1.2	N. 78½ W.	0.6	N. 78½ W.	0.5 Flood
	S. 87½ E.	0.5	S. 66 E.	1.0	S. 66 E.	1.0	S. 62 E.	0.5 Ebb
In Gedney's Channel	N. 51 W.	1.4	N. 71 W.	2.0	N. 71 W.	1.8	N. 71 W.	1.4 Flood
	N. 30 E.	2.0	N. 73 E.	2.9	S. 76 E.	2.0	S. 76 E.	1.4 Ebb
East entrance of the Swash	N. 56 W.	1.5	N. 62 W.	1.5	N. 62 W.	1.8	N. 62 W.	1.6 Flood
	N. 64 E.	1.5	S. 55 E.	2.0	S. 47 E.	2.0	S. 47 E.	1.5 Ebb
East entrance of East Channel	N. 45 E.	1.0	N. 3 W.	1.6	N. 13½ W.	1.6	N. 13½ W.	1.0 Flood
	S. 89 E.	1.4	S. 75 E.	1.8	S. 71 W.	2.2	S. 71 E.	3.0 Ebb
Buoy on the Knolls.	S. 21 W.	1.2	S. 67 W.	1.3	S. 78 W.	1.8	S. 89 W.	1.0 Flood
	N. 61 E.	1.3	S. 81 E.	1.8	S. 52 E.	1.8	S. 39 E.	1.3 Ebb
West entrance of the Swash	South.	2.0	S. 21 W.	2.0	N. 41 W.	2.0	N. 51 W.	1.5 Flood
	N. 81 E.	1.0	S. 66 E.	1.4	S. 40 E.	1.4	S. 24 E.	1.0 Ebb
Middle of the Swash	N. 55 W.	1.7	N. 55 W.	1.7	N. 55 W.	1.4	N. 55 W.	1.7 Flood
	S. 70 E.	2.1	S. 60 E.	2.1	S. 57 E.	1.0	S. 57 E.	1.0 Ebb
½ mile E. of buoy on West Bank	S. 9 W.	1.8	N. 81 W.	1.8	N. 23 W.	1.8	N. 15 W.	1.0 Flood
	N. 45 E.	1.0	N. 77 E.	2.4	S. 34½ E.	2.0	S. 16½ E	1.0 Ebb
1 mile W. of west end of Coney Island	S. 72 W.	0.8	N. 22½ W.	0.8	N. 26 W.	1.4	N. 40 W.	1.4 Flood
	N. 16 E.	1.6	S. 15 E.	2.0	S. 15 E.	2.5	S. 15 E.	2.0 Ebb
Chan. between Bedloe's Isle & Robin's Reef	N. 59 E.	1.0	N. 47 E.	1.8	N. 35½ E.	1.4	N. 35½ E.	1.2 Flood
	S. 73 W.	1.0	S. 44½ W.	2.4	S. 44½ W.	3.0	S. 44½ W.	3.0 Ebb
Off the Buttermilk Channel	East.	1.0	N. 47 E.	2.0	N. 41½ E.	1.5	N. 47 E.	1.2 Flood
	N. 88½ W.	1.0	S. 65 W.	2.4	S. 47½ W.	3.0	S. 47½ W.	3.0 Ebb
At junction of North and East Rivers	N. 81½ E.	1.0	N. 24½ E.	1.8	N. 15 E.	1.8	N. 15 E.	1.0 Flood
	S. 68 W.	1.6	S. 42½ W.	2.4	S. 16 W.	2.4	S. 16 W.	1.5 Ebb
In the East River	N. 68 E.	2.0	N. 68 E.	3.0	N. 68 E.	2.0	N. 68 E.	1.6 Flood
	S. 56 W.	1 2	S. 56 W.	3.7	S. 56 W.	2.7	S. 56 W.	2.0 Ebb
In False Hook Channel	N. 39 W.	1.5	N. 23 W.	2.0	N. 17 W.	2.0	N. 17 W.	1.0 Flood
	S. 36½ E.	1.5	S. 21 E.	1.5	S. 25 E.	2.4	S. 25 E.	1.5 Ebb
At the W. entrance of East Channel	N. 78½ W.	0.6	N. 65 W.	1.8	N. 51 W.	1.8	North.	1.6 Flood
	S. 87 E.	0.7	S. 72½ E.	1.5	S. 58 E.	2.3	S. 43 E.	1.0 Ebb
Middle of the East Channel	N. 11 E.	0.9	N. 10½ W.	1.5	N. 30 W.	1.4	N. 49 W.	0.9 Flood
	N. 80 E.	1.0	S. 75 E.	2.2	S. 75 E.	2.8	S. 75 E.	1.0 Ebb

The stream at half ebb, in the Swash Channel, sets strongly to the eastward; care should therefore be taken to avoid being drifted on to the Dry Romer. In the Eas Channel the flood sets towards the Romer, and the ebb towards the East Bank, or which due allowance should be made.

Anchorage may be had in Sandy Hook Bay. When as far in as the point of the Hook where the East Beacon stands, haul into the bay S.W., giving the Hook a berth of half a mile, until the lighthouse bears East or E. by N., when you may anchor in from 4 to 6 fathoms, muddy bottom.

Pilots.—New York pilots generally board vessels from the southward between Delaware River and Barnegat Inlet, at from 10 to 80 miles off shore; and those from the eastward between Nantucket Shoals and Fire Island Lighthouse, at from 10 to 15 miles from shore. Boats having pilots on board are always found near Sandy Hook. In approaching New York Bay in thick weather, or in the night time, without a pilot, you should bring-to in 12 or 15 fathoms, unless the weather is threatening from the eastward, when it is most prudent to avoid a lee shore.

DIRECTIONS.—*Soundings, &c.*—The Gulf Stream, by its high temperature, gives the first warning of an approach to the coast. In lat. 38½° N. it is nearly 360 miles from the land, measuring on a parallel of latitude, and immediately after passing through it the temperature will be observed to begin to fall. There is also a fall of temperature on striking soundings, which will indicate the time when the deep-sea lead ought to be used. With the decrease of soundings the colour of the water will change, as from a dark blue in a depth of 150 fathoms the colour alters to a light blue in 50 fathoms, which again becomes of a greenish tint as the coast is approached.

The depth of 90 and 100 fathoms is at about 80 miles from the coasts of Long Island and New Jersey, and outside this the soundings are rapidly lost. Forty fathoms are met with at about 45 miles from the eastern portion of Long Island, and 60 miles from New Jersey, the soundings more gradually decreasing towards the latter coast than the former. When east of the Delaware the bottom between 100 fathoms and 40 fathoms is most frequently of sand and broken shells, while inside of the latter depth there is grey or yellow sand with black specks. To the northward of this parallel the bottom is as often of mud as of sand, the mud being more frequently met with when going to the N.E. until off Block Island, when the bottom from 100 to 20 fathoms being mostly of green sand and oaze, has obtained the name of the Block Island Soundings. It may also be remarked that green mud or oaze cannot be found within the distance of 15 miles of Block Island, and seldom to the westward of the meridian of Montauk Point, in less than 30 fathoms water.

In general the soundings decrease regularly and more or less gradually from 100 or 80 fathoms to the shore, but there are some remarkable exceptions, among which may be mentioned the Five Fathom and other banks at the entrance to the Delaware. The principal exceptions are, however, the mud-holes, which extend in a S.E. direction from Sandy Hook, and form a very remarkable gorge. These holes are not very large, but as they are frequently met with, a description of them appears to be necessary. When passing over them, the least distance from New York at which a depth of 100 fathoms is found is 100 miles.

Mud Holes.—The first holes met with after leaving New York are the Twenty-three, Twenty-one, and Thirty-two Fathom Holes, which lie at the distance of 11, 12½, and 17½ miles from Sandy Hook lighthouse, in a south-easterly direction. They are not very extensive, but you may know when you are over them by the lead dropping suddenly into them from a depth of 16, 13, or 17 fathoms. Between these holes and the New Jersey coast the soundings decrease from 15 to 13 and 7 fathoms, the latter depth being close to the shore.

The next hole, that with which seamen are more particularly acquainted, is called the First Thirty-seven Fathom Hole. It is about 8 miles long and 1½ mile wide, and has 22 fathoms immediately outside it, with soundings of 20 and 19 fathoms close to its south-western extremity. Its centre is distant from Sandy Hook lighthouse 28 miles in a S.E. ¾ S. direction.

The Second Thirty-seven Fathom Hole lies 7 miles to the south-eastward of the First, with Sandy Hook bearing N.W. ½ N., distant 39 miles. It is about 5 miles in extent, and has 27 fathoms outside it in a N.E. direction, but only 21 fathoms in a southerly direction.

The Thirty-eight Fathom Hole lies 11 miles to the S.E. by E. ½ E. from the Hole last mentioned, in lat. 39° 55′ N., and long. 73° 10′ W. Its length is 8½ miles from North to South, and its width 2½ miles. From it Sandy Hook bears N.W., distant 50 miles. Close to it are 25 to 29 fathoms, and near its northern end are 25 and 24 fathoms.

At 11 miles South (true) from the Thirty-eight Fathom Hole is another of Thirty-five Fathoms, which is about 4 miles in extent, and lies with Sandy Hook bearing N.W. by N. 63 miles; it has 27 fathoms close to it outside, which deepens rapidly to 30 and 34 fathoms.

The Fifty Fathom Hole lies in lat. 40° N., and long. 72° 30′ W., at about 50 miles from the shore of Long Island. It is 4 miles in extent, and has 35 and 38 fathoms close-to all round. From it Sandy Hook bears N.W. by W. ½ W., distant 74 miles.

The ninth and last of the mud holes is the most extraordinary of the whole series, as the lead at once falls from 55 to 60 fathoms into a depth of 145 fathoms. It is situated about 12 miles within the edge of soundings of 100 fathoms, and lies in lat. 39° 38′ N.,

and long. 72° 23′ W. Its extent is not more than 2½ miles, and from it Sandy Hook bears N.W. ½ W., distant 89 miles.

It has been observed that in approaching Sandy Hook, the soundings to the southward are full of black specks, between the depths of 10 and 20 fathoms; in the true channel they are of mud; while to the northward, near Long Island, they are of black and white sand.

Foggy Weather, &c.—The instructions deduced from the foregoing observations will doubtless be of considerable service to masters of vessels in the night-time or in thick and hazy weather. Therefore, when coming from the eastward and striking soundings in more than 35 fathoms, green mud, steer to the northward of West, shoaling the water very gradually on that course. If beating against a westerly wind, do not stand into less than 18 fathoms on the northerly tack, till nearly up with Fire Island Lighthouse, for the soundings inside of 25 fathoms decrease very rapidly towards the Long Island shore, but very slowly towards that of New Jersey, a distinction that should be carefully borne in mind.

When coming from the southward a depth of 15 fathoms and upwards should be preserved, for to the northward of Barnegat Inlet 10 or 12 fathoms is found within 1¼ mile of the beach. When the water has decreased to 15 fathoms, the lead should be kept constantly going and the bottom examined; gravelly bottom indicates too near an approach to the land.

Remarks on approaching the land.—The appearance of Long Island is generally low and level, excepting a few hills, which lie 40 miles to the westward of Montauk Point. Along the south side of the island a flat extends all along the shore, which at the mouths of some of the inlets, especially those westward of Fire Island, runs off about a mile. Your course from Montauk Point to Sandy Hook is S.W. by W. ¾ W., 60 miles, and then W. ¼ N., 45 miles. At 12 miles southward of Montauk Point there are 20 and 23 fathoms, coarse grey sand and gravel with black specks, which depth is maintained at the same distance from the land until you get to about 20 miles eastward of Fire Island Lighthouse, when you will meet with soundings of 20 to 18 fathoms, thence decreasing to 16, 15, 14, and 13 fathoms, and again deepening to 16 fathoms as you approach the harbour of New York. Within this distance from the shore it is not safe for a large ship to approach without a commanding breeze, because the coast of Long Island is steep-to, having 6 and 7 fathoms immediately off the edge of the flat, and the line of 20 fathoms approaches Montauk Point to within 7 miles, the soundings between decreasing very rapidly. In the vicinity of Fire Island Inlet, the depth is shoaler, there being 12 to 15 fathoms at 8 miles from the shore. Outside the depth of 20 and thence to 40 fathoms, the character of the bottom changes so rapidly that constant reference must be made to the chart, as no general description would be at all applicable. The difference in latitude between Montauk Point and Sandy Hook is only about 37 miles, but there will be no difficulty in determining which of the two you are approaching, as the character of the lights and that of the soundings afford an infallible distinction.

In passing the Nantucket Shoals between latitudes 39° and 39° 30′, you should take notice, if possible, when you have crossed the Gulf Stream; as, at the distance of 10 leagues, within it, you may expect soundings; so soon as you obtain which, you will possibly experience a S.W. current.

Should you now be running for the New Jersey Coast, to the northward of Great and Little Egg Harbours, you may suddenly strike one of the Mud Holes previously mentioned as existing in a south-easterly direction from Sandy Hook. In that case it will be necessary to take particular notice of your position, because many ship-masters have been deceived, especially by those near Sandy Hook, and fancying themselves at a greater distance from the coast of New Jersey than they really were, have run on and put themselves to considerable inconvenience, and even danger. It should be remembered that the coast of New Jersey is steep-to, there being 6 to 10 fathoms immediately off it.

If beating to windward of Sandy Hook, in from 12 to 15 fathoms, when waiting for a pilot or a wind, either by day or night, when the lighthouse bears nearly West, you will be sufficiently near to Long Island.

Should you fall in so far to the southward as to approach Cape Hatteras, be very cautious of its shoals, and bear away to the N.N.E., so as to obtain soundings on the Jersey shore. When you have gained 28 or 26 fathoms in latitude 40°, haul in to make the land.

It has been remarked that ships from sea, approaching any part of the American coast between Long Island and Cape Hatteras, if in doubt about their reckoning, should take notice of what is commonly named the Gulf Weed, which is in great plenty, and in larger clusters to the eastward of the Gulf Stream than in it, where the sprigs are but small and few. Within the stream there is no weed, unless in rare instances, and there, as before observed, the colour of the water changes to a still darker and muddy colour.

If you fall in to the northward of the Chesapeake, approach the Chincoteague Shoals no nearer than into 15 fathoms: from this steer N. by E. until nearly up with Great Egg Harbour, keeping the lead going. You may advance towards this place, and to the northward, to the depth of 15 fathoms. From Great Egg Harbour to latitude 39° 30′, the shore trends about N.E. by N., and thence to the high lands of Navesink nearly N. by E.

Should you fall in so as to make the Capes of the Delaware, keep above 6 leagues off the land, or in not less than 15 fathoms, in order to avoid the bank named the Five-Fathom Bank, which lies 15 miles E. by S. from Cape May lighthouse, and is marked by a lightvessel moored in 12 fathoms S.E. ½ S. from its shoalest (13 feet) spot, which exhibits two fixed lights, and is provided with a bell and fog-horn. After passing the bank, which is steep-to, you may haul up N.E. for 45 miles, which will lead into 15 fathoms, off Little Egg Harbour, and by altering the course to N.N.E. for 18 miles, will reach Barnegat. Here the soundings will be coarse grey sand, with a few shells and gravel; and having these soundings, you may steer along in the direction of the land N. by E., on which course you will have from 16 to 18 fathoms. In the day-time you will notice the Woodlands, between Barnegat and Sandy Hook, which is a remarkable part of the coast, resembling, it is said, no other land between Cape May and the high lands of Navesink. It is in this part of the coast of New Jersey, between Barnegat and Shrewsbury Inlets, that so many fatal shipwrecks occur from approaching too near the land; they principally take place on Squan and Long Branch Beaches.

It is said that Barnegat may be readily known in the day-time, even when the breakers are not seen, as there is a long grove of wood, back in the country, apparently 3 or 4 miles long, directly within the inlet named the Little Swamp. With the north end of this land directly abreast, you will be to the northward of Barnegat.

There is another grove, directly in the rear of Egg Harbour, which is known by the name of the Great Swamp; this is much higher than the former, the Little Swamp, and is 8 or 10 miles in length. These swamps cannot be seen at one time, as the distance between Egg Harbour and Barnegat is 6 leagues.

Barnegat lies S. by W. ½ W., 43 miles from Sandy Hook. When hauling in for the Woodlands already mentioned, with the wind off shore, you may, in a small ship and exercising great care, keep within a short distance of the coast, until up with the Highlands; and, should your vessel not draw more than 10 feet, may continue your course until up with the northernmost part of the cedars on Sandy Hook; after which steer according to the subsequent instructions. When approaching Sandy Hook there are some shoal spots of 10 and 20 feet, about 2½ miles before reaching the entrance of Shrewsbury Inlet; and also along the shore of Sandy Hook there are some banks of 10 to 17 feet, named the Middle Ground, Oil Spot, &c., all which must be cautiously avoided.

On the southern side of the entrance to New York Harbour are the Highlands of Navesink, the highest part of which, Mount Mitchell, is estimated to be 282 feet above the sea. This high land of Navesink is a very important mark when approaching the coast, as it can be seen from the First Thirty-seven Hole, when you are 8 leagues off, and in a depth of 30 or 36 fathoms water. It appears at first like an island, being pretty level on the summit, excepting some irregular risings towards Point Comfort, on the west end or inland side. As you approach nearer to the harbour, you will see some other high land, situated more at the back of the bay, the first of which may be Hempstead Hill in Long Island, the summit of which is about 320 feet above the sea level. On Staten Island is Tompkins' Hill, at the back of the small village of Tompkinsville, which is estimated to be 307 feet high. Both these hills will be seen after you have made Navesink.

To enter the harbour.—Having made the lightvessel, which should be the object sought for, especially by a stranger, and still without and waiting for a pilot, be

careful when tacking towards either the Jersey or Long Island shores not to decrease your water below 10 fathoms. Should no pilot be obtainable and it becomes advisable to run in, then the following directions will be found of service, bearing in mind that the only channels recommended to those ignorant of the navigation are Gedney's and the Main Ship Channel, in which are 23 feet at mean low water, or the South and Swash Channels, with 21 and 17 feet respectively.

Entering by *Gedney's* and the *Main Ship Channels*, steer N.W. ½ W. from the lightvessel for the black and white perpendicular-striped nun buoy at the entrance of the former, then W. by N. 1½ mile, or till the two range lights near Point Comfort* come in line, bearing about W. by S., when you must haul up for them on that bearing, and continue till the two Main Channel lights, just westward of the Highlands of Navesink, are brought in range, nearly S. by W., which will also be shown by the main light on Sandy Hook being open south of the West Beacon. Steer now, with these latter lights in line over the stern, about N. by E., which will lead up towards the Narrows, clear of West Bank and Craven's Shoal. As soon as Robin's Reef light bears N. by W., shape a course for it, passing in mid-channel through the Narrows (see *Note* at foot of page 158), and when about ¾ of a mile from the lighthouse haul up N.E. by N. for the city.

Entering by the *South* and *Swash Channels*, steer from the lightvessel W. by N., until the Elm Tree or Swash Channel range lights on Staten Island, which can be seen outside the bar, come in a line bearing about N.W. ½ N., then steer towards them till the red can buoy (No. 8), which marks the "Upper Middle," is passed, or till the Main Ship Channel range (lights in one, nearly S. by W.) is on, when haul up on that range towards the Narrows, and proceed as before. Vessels drawing more than 17 feet should not be taken through the Swash Channel on the above range at low water.

Having proceeded on the line of the Elm Tree lights from the South Channel bar to where the Point Comfort lights are in one, the direction of the latter may be followed, and the Main Channel lights brought in line as before, if drawing too much water to pass through the Swash Channel.

The *False Hook Channel*, safe though narrow, runs along the eastern side of Sandy Hook, between it and the Outer Middle, the Oil Spot, and False Hook Shoals. From 15 to 18 feet of water can be carried through at the distance of ¼ of a mile or so from the shore; but as no good ranges can be given, this passage should only be attempted by those acquainted. The shoalest part of the shoals, namely 12 feet on Oil Spot, lies ¾ of a mile off shore, and S.E. by E. ¼ E. from the main lighthouse on the Hook.

The *East Channel* has its entrance about one mile northward of Gedney's, and runs in nearly parallel to that and Swash Channel, being separated from them by the Dry Romer, &c.; it is safe for vessels of light draught, but is very little used, as the ranges are distant and uncertain, and the East Bank shoals up very suddenly.

The *Fourteen Feet Channel*, about 2½ miles from the shore of Coney Island, is narrow, winding, and without leading marks or buoys. It is the northernmost of the channels into New York Bay, and but very seldom used.

For a description of the East River from Long Island Sound to New York, see page 151.

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* A stranger, when up with the buoy at the entrance of Gedney's Channel, may cross the bar in 21 feet water by bringing the East Beacon on Sandy Hook in line with the inner (or Wilson's) light at Point Comfort, nearly W. ¼ S. When the water deepens again to 4 fathoms, steer to the northward, so as to bring Gedney's Range Lights on to pass the Hook.

THE END.

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